



Mr. John Abercrombie.

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THE
PROPAGATION
AND
BOTANICAL ARRANGEMENTS
OF
PLANTS AND TREES,
USEFUL AND ORNAMENTAL,
PROPER FOR CULTIVATION
IN EVERY DEPARTMENT OF
GARDENING;
NURSERIES, PLANTATIONS AND AGRICULTURE.

CONTAINING
The fullest practical Directions for performing all the different Methods of Vegetable Propagation, by which the various Kinds of Plants, Trees, Flowers, Fruits, &c. are raised and increased in the greatest Abundance and Perfection:

Now First thoroughly explained.

WITH THE
Compleatest Botanical Arrangements of all the Species and Varieties of Plants, Trees, Shrubs, Flowers, Fruits, Herbs, Corns, Grasses, &c. proper for Cultivation in every District of Gardening, Nurseries, Plantations, Green-Houses, Hot-Houses, and in Fields, all ranged in their proper Genera or Families; with the Universal Botanic, Latin and English Names of the Genera and Species, &c. and in the greater Part, short specific Descriptions, mentioning also their native Places of Growth; the Whole according to the latest Modern Improvements of the Linnæan System; comprised in Eight Divisions, viz.

- | | |
|--|--------------------------------------|
| I. Kitchen-Garden Plants. | V. Annual Flower Plants. |
| II. Fruit Trees. | VI. Green-House Plants. |
| III. Forest and Ornamental Trees and Shrubs. | VII. Hot-House Plants. |
| IV. Herbaceous, Perennial, and Biennial Flower Plants, &c. | VIII. Field, or Agricultural Plants. |

The Whole forming a very necessary and useful Companion to all Gardeners, Nursery-Men, Florists, Botanists, Planters, Seedsmen, Farmers, and every one concerned, either in the Cultivation, or Oeconomical Uses, &c. of the Vegetable Kingdom.

By JOHN ABERCROMBIE,
Author of EVERY MAN HIS OWN GARDENER.

IN TWO VOLUMES.

VOL. I.

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P R E F A C E.

TH E work which is here offered to the public being a truly original performance, upon a plan never before attempted, the author hopes it will prove the more acceptable. It is designed to be a general and useful companion in all the various branches of universal Gardening, by conveying a thorough knowledge, founded on practice, of the different methods of propagation, whereby all the cultivated trees and plants in the known world are raised or increased, in the most successful and expeditious manner. It also conveys a general systematic knowledge of the plants themselves, in their numerous species and varieties, and the various methods of their cultivation; together with a correct Botanical Arrangement of them in their proper families, or genera, agreeable to the latest improvements of the Linnæan System.

The plants being systematically distributed into distinct divisions, according to their use, nature of growth, temperature, &c. and adapted to every department of gardening, it is hoped this treatise will prove an useful assistant to all those who are any ways engaged in the cultivation or oeconomical uses of the vegetable creation. And as it is altogether improbable that any one garden, or plantation, however extensive, should be furnished with every cultivated plant, these arrangements will be found useful, in shewing what plants are cultivated, in all the different gardens and nurseries united, as also to what district of gardening they respectively belong; which will enable every gentleman, with ease, to make a selection of any particular species which he may be desirous of cultivating.

The work naturally divides itself into two parts. In the first part is contained, most ample directions for performing all the different methods of propagating the numerous species and varieties of plants, trees, flowers, &c. now in practice in every department of gardening; each method,

in all its different modes, being fully explained under its respective head. A point of information in which former writers on the subject have generally contented themselves with giving only a few slight hints.

The second part comprizes compleat Botanical arrangements, in their proper families, of all the species and varieties of plants, trees, shrubs, flowers, fruits, herbs, &c. (both natives and exotics) proper for useful and ornamental cultivation, in the garden, plantation, or field; displayed under eight divisions, according to their different uses, nature or habit of growth and temperature. In these divisions the plants are arranged alphabetically under their Botanical or Latin names; agreeable to the laws of the sexual system of Botany; and under each family, or genus, the Latin botanical trivial names of the species, are arranged, together with their English appellations and common English names. The native places of growth of the Exotics are also mentioned, together with specific descriptions of each species. Care has been taken, in these arrangements,

ments, to include such new plants as have been lately introduced into the botanic system, and have merit, either for use, ornament, or variety, so far as they could possibly be obtained; as they are annually increasing in number, especially exotics, from various and distant parts of the world.

Upon the whole, it is humbly presumed that this treatise will prove of real utility to the country gentleman, the florist, the gardener, the farmer, and every person engaged in any branch of horticulture.

N^o 319, Oxford-Street,
London.

JOHN ABERCROMBIE.

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T H E

COMPLETE GARDENER,

O R

NURSERY MAN'S COMPANION.

I. *Of the PROPAGATION by SEED,
in the various Practical Methods of
Sowing.*

IN the vast diversity of the vegetable kingdom, in the different structures and habits of growth of the numerous families and species of plants and trees, &c. recourse is had to many different methods for propagating and perpetuating the desirable species and varieties, for the various purposes for which they are cultivated and designed, either for use, ornament or curiosity ; and the propagation by seed may be considered as the primary or original method, by which

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the general supply of the vegetable creation was first obtained for furnishing our gardens and plantations; as every vegetable from that of the most diminutive state, up to the loftiest tree of the forest, most certainly furnishes seed, according to its nature and kind, more or less, for multiplying and continuing its respective species, &c. And by which a very considerable tribe, both of herbaceous plants, and trees, and shrubs, are still principally raised in every department of gardening; performed by many different methods of sowing, according as the different sorts of seeds, kernels, nuts, stones, berries, &c. require, and as hereafter fully explained.

A prodigious family of the vegetable tribe, in all branches of gardening, come under the propagation by seed; some requiring to be propagated thereby every year, in successional supply, as in the numerous family of annuals and biennials both of the kitchen and flower garden, they being but of one and two years duration, afford no other means of propagation than by seed; others, as in the vast tribe of perennials, which being of many years duration, require only occasional supplies raised from seed; as these sorts afford not only the opportunity of seminal propagation, but also, when once thereby obtained, many sorts thereof furnish either suckers, off-sets, layers,

ers, slips, &c. by which they may likewise be propagated and perpetuated. And in the tree and shrub kinds, numerous sorts are also propagated by seed, especially many of the forest trees, and ornamental tree and shrub kinds, both deciduous and evergreens, and which likewise in many sorts propagate by suckers, cuttings, layers, grafting, budding, &c. all of which is fully directed under their proper heads.

But in the propagation by seed, it may be remarked, that as there are many sorts of exotic plants and trees, which either do not produce seed at all in this country, or not sufficient for a plentiful propagation, and in others the seed is not easily obtained, and in which cases, if but a few plants can be raised from seed, &c. especially of perennial plants, and many of the tree and shrub kinds, their further propagation may afterwards be more abundantly effected by some of the other methods, such as either by suckers, slips, off-sets, layers, cuttings, grafting, budding, &c. according to the nature of the different sorts.

Also in many cases, where seed is abundant, and where the approved varieties of any particular species, either herbaceous perennials, or trees and shrubs, are occasionally obtained from seed, and that when endeavouring to raise the same varieties again by the same mode of propagation,

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it cannot be effected with any degree of certainty, as they generally vary considerably in the seedlings, to other different varieties of a degenerated race, and on which consideration, it is always proper to propagate the improved varieties, by any other method than by seed, such as by suckers, slips, off-sets, layers, cutting, grafting, budding, &c. according as the different sorts of plants admit; and, by which practice, we can with the greater certainty continue the desirable improved varieties constantly the same without the least degeneracy, as is requisite in propagating many of the flowering perennials, most sorts of fruit trees, and all curious varieties of ornamental trees and flowering shrubs, for the varieties of these rarely ever come the same again from seed; so are only propagated by that method occasionally, when designed to try to gain new varieties, of any particular species as before observed, in order that by raising many fresh seedlings, there may be a chance of having among them some new kinds; for all varieties of any particular species, both of esculents, flowers, fruits, trees, &c. were accidentally obtained from seed, of one parent species of the respective kinds.

However, as there are numerous sorts of plants, and trees, in which the varieties always retain their respective distinction from

seed, by constantly coming the same again in regular succession in the seedling plants, and the seed thereof abundantly plenty, the propagation therefore by seed is the principal method by which vast numbers of the vegetable kingdom is commonly raised, both of the herbaceous and woody tribe, consisting both of esculents of the kitchen garden, numerous flowering plants, and many of the forest and ornamental tree and flowering shrub kinds, and evergreens; and by which they can be abundantly propagated.

By seed numerous sorts of herbaceous plants require to be raised in successional supply annually, as in all the annual and biennial tribe, which being plants of only one or two years of duration, consequently must be raised in proper quantities every year to succeed one another for their respective uses, both in the kitchen and flower garden: for far the greater parts of the kitchen esculents are the annual and biennial kind, which being produced from seed in spring and summer attain perfection for use the same year, and then either run to flower and seed the same season or spring following, and totally perish, or become useless, and fresh supplies must be raised from seed: the same also prevail in a great number of the flower plants for the pleasure-grounds being annual and biennial;

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but considerably most of the annual kind, which all rising from seed in spring, &c. flower, ripen seed, and totally decay the same year in autumn and winter, and the biennials rising from seed one year, the next they shoot up to flower and ripen seed, then either shortly die, top and root, or never survive to flower again in any tolerable perfection; so that both of the annual and biennial flowers, a successional supply must be raised from seed every spring or summer.

But in the perennial or abiding plants both of the herbaceous and tree and shrub kinds, they being of long duration, require only occasional supplies raised from seed, of such as are either generally or occasionally propagated by that method, as when once a supply of these sorts are raised, they remain many years; and in numerous sorts they afford either off-sets, suckers, layers, slips, cuttings, grafts, &c. according to what they are, for propagating their respective species. Or where larger supplies are necessary, or to have a chance of obtaining new varieties, then recourse is had to the propagating by seed, according as, in either case, they may be occasionally wanted.

Thus it may be observed, that a very large share of the vegetable creation is propagated by seed in every department of gardening, both of numerous herbaceous plants

plants, and very many sorts of trees and shrubs.

By seed the greater part of our valuable esculent plants of the kitchen garden is raised, and as being mostly of the annual and biennial kinds, fresh supplies thereof are raised by that means every year in spring, summer and autumn, many sorts requiring to be sowed several times in one season to obtain so many different crops succeeding one another, as in spinach, lettuce, peas, beans and various others, of the annual sorts, which continue but a short time in perfection: and even in some that are perennials, or of many years duration by the root, they are also propagated only by seed, such as asparagus in particular, others of a perennial nature are propagated both by seed and by slips, and off-sets, &c. occasionally, such as skirrets, burnet, sorrel, thyme, winter savory, hyssop, &c.

By seed also a vast family of the flowery tribe is propagated every year, particularly all the annual and biennial plants, as before suggested, the former of which being very numerous; and in both, the propagation by seed, is the only general method by which they can be raised or encreased, except in a very few particular sorts, which sometimes may be continued by slips, off-sets, cuttings, &c. And, as we before hinted, many of the perennial flowers may also be raised from seed, and by which great choice of

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new and curious varieties thereof are gained, both in regard to colours, variegations, and doubleness, &c. of the flowers, for in several of the most capital species the varieties obtained from seedlings are without end, as in the auricula, polyanthus, carnation, tulip, hyacinth, anemone and ranunculus, &c. and still more new ones are annually acquired by those who will take the pains to sow a little seed every year; as it is from seedlings those vast collections of beautiful flowers in variety, were procured, which now adorn the gardens of the curious florists. The seed of one parent species often furnishes many different varieties. The varieties are increased and continued permanent by propagating them either by off-sets, slips, layers, &c.

Likewise by seed many choice varieties of fruit are occasionally raised, as all those fine varieties of the respective species, of our different kinds of fruits were from time to time accidentally obtained from seedling plants, for by sowing the seeds, kernels, stones, &c. of the respective fruits, the plants or trees rising therefrom, sport into many different variations, producing fruit often very different from that of the parent tree; and when any desirable new variety is thus obtained, it is increased and continued the same by grafting, or budding, layers, cuttings, &c. as hereafter directed under those heads.

And

And by seed a great number of our most valuable forest trees are propagated, also very many ornamental trees, flowering shrubs, and evergreens, as also many sorts of green house and stove exotics, both of the herbaceous, succulent and woody kind.

As there are numbers of curious plants and trees, that when raised from seed afford a choice of different varieties of particular species, it is of importance to pay attention thereto, of such kinds in which an improvement of new varieties, will be the most acceptable, such particularly as some of the capital species of kitchen plants, flowers and fruits; but many of the flowering tribe and most sorts of fruit trees, are more particularly prolific in varieties: though all the different valuable esculent varieties of the kitchen garden were also obtained from seed by attending to the several kinds from time to time, as new sorts discover themselves; for example, the *Brassica*, or cabbage, in which, according to the botanists, one parent species furnished all the different varieties of heading-cabbages, savoys, and all the open cole kinds; the same also obtained in the pea, bean, kidney bean, and several other esculent species; and in the flowery tribe, the seedling varieties in some sorts of one mother species are, in a manner, without end, as we before hinted both in the annual, biennial and perennial kinds, but more abundant in some

capital species of the latter, such as in auricula, polyanthus, carnation, tulip, hyacinth, anemone, ranunculus and some others, as already observed. And in most of our fruit trees they are remarkably prolific in different varieties, accidentally gained from seedlings; and the like also prevails in several eminent species of forest and ornamental trees and flowering shrubs, such as in the holly, the varieties of which that have accidentally risen from seed, are very considerable, and curious; also in the rose and many other sorts.

So that the propagation of plants and trees by seed may be extended very considerably both in the encreasing the number of species, and in procuring new varieties of many sorts thereof, as well in the propagation of many eminent varieties of certain species, which retain their respective distinction from seed.

It is proper to observe, that under the denomination of seeds by which the various sorts of plants and trees are propagated, is comprehended several classes thereof, such as all the granulous or small seeds, all the kernels and stones of fruits, the various sorts of nuts, acorns, berries, mast, &c. and as the seeds of plants, are produced various ways, as in pods, capsules, cones, fruits, &c. all those contained in such seed vessels must be cleared out therefrom for sowing; though some sorts being contained in small
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berries, as haws, hollies, yew, &c. may be occasionally sowed, the berries and seeds together, previously bruising the berries to separate the seeds as well as possible, and that they may have more liberty to germinate sooner, and with greatly facility; likewise most of the nut kind, acorns, and mast should be sowed with the nuts, or respective covers, &c. entire.

As to the general season for sowing the various sorts of seeds, it is principally in the Spring, February, March and April, especially for the principal crops of kitchen herbage; most sorts of flowers, and many kinds of trees and shrubs, particularly the more tender sorts, and most sorts of evergreens; though seeds of many sorts of kitchen esculents require to be sowed every month all spring and summer, to continue a long succession of crops for use, and some in autumn to stand the winter for early spring and summer supply next year; and as to the hardy tree and shrub kinds, they mostly succeed, both by the autumn and spring sowing, performing that of autumn in September, October and November soon after the seeds are ripe, or if cold moist soils, better defer sowing till February or beginning of March, and which season is generally the most safe and successful for sowing the seeds of evergreens; observing of the nut kinds, acorns, kernels &c. when kept for spring sowing they may be more effectually preserved sound

by laying them in dry sand till that season.

It is to be remarked, that as some tree and shrub seeds, of the very hard nut or stone kind, remain in the ground two years after sowing before they come up, such as haws, holly-berries and some others, with hard bony seeds, in a dry situation, they are previously prepared for vegetation a year before they are committed to the earth, in the order of sowing, by either burying them as soon as gathered, in a heap in a grave or trench, or in large pots plunged under ground, in a dry situation, covering them over the top, in either method, with dry straw, and then with earth, in a ridge, six or eight inches deep or more, where being permitted to remain till next Autumn, or second spring following, then taken up and sowed in the common method, they will grow freely and come up at the proper season in spring; or if those kind of hard seeds are sowed at once as soon as ripe, in beds of common earth, as hereafter directed, keeping the beds clean from weeds all summer, the seeds will mostly germinate and come up the spring twelve month after sowing.

Observe, it is proper that almost all sowing should be performed while fair weather, especially in early spring work, and in all wet soils, but when the season is more advanced, and in summer, it is of great advantage to
sow

sow when there is a prospect of rain falling shortly, or immediately after rain, especially dry soils, and after it has been a long drought.

With regard to the method, of performing the propagation by seed, it is effected several different ways in practice, according to the nature of the several classes of seeds, and that of their plants, their order of growth, and particular uses, and whether designed to remain where sowed, or to be transplanted, as also the nature of the soil, in regard to its being of a light or heavy temperature; and is comprehended under the following heads, viz.

Common broad-cast sowing in one continued plat and raking in the seed.

Broad-cast sowing in beds, and raking in the seed.

Broad-cast sowing in beds, and covering in the seed with a rake.

Broad-cast sowing in beds and covering in the seed with the spade.

Sowing in beds and covering in by sifting earth over the seed.

Sowing in drills, by different methods.

Sowing in patches.

Sowing by dotting in the seed with a dibble.

Sowing in pots.

Sowing in frames.

Sowing in hot-beds.

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All these different methods of sowing seed, being practised occasionally as different cases require, each is fully explained under its proper head; as follows:

1. *By common broad-cast sowing in one continued plat, and raking in the seed.*

The method of broad-cast sowing in one continued plat of ground, and raking in the seed, without dividing the ground into narrow beds, is an expeditious way of sowing any large spaces in extensive kitchen gardens, &c. and also saves ground by not having it in beds with vacant spaces for alleys between, and is a very eligible method both in large and small gardens, for the sake of making greater dispatch in performing the sowing, and is effected both by sowing any large quarters, or compartments of ground, or borders, &c. without either dividing the ground into beds, or previously raking it, but sow all over the rough surface of the whole space of land intended, and then rake the seed in with a large rake, observing as below.

In preparing for sowing the seed, the ground should be fresh digged or trenched at the time, or if it has been trenched up in ridges or otherwise, some considerable time before by way of fallow, it should be generally levelled down or fresh turned over at
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the proper season for sowing, for it is of importance to have a fresh surface for the reception of the seeds; observing in digging to break all the large clods, lay the surface even for the reception of the seeds, leaving the surface rougher for seeds of the larger size, and smother for the small kinds, but not made finer than with proper breaking and levelling with the spade, as you proceed in the digging, not raking any till after the seed is sowed.

Then as to the work of sowing, take opportunity for this, of dry weather, and while the surface is fresh stirred, before it is too much dried by the sun and air, or wetted by rain, &c. but while of a middling temperature between moist and dry, so as it will readily break under the rake, and without clogging thereto, or to your feet; thus far observed, step out your ground, if a large quarter, into spaces of ten or twelve feet width, as a guide to sow every part regular, but in small compartments and borders this is not necessary: and then proceed with the sowing all over the general surface, by advancing there with regularly up one space and down another discharging the seeds from the hand, either by a broad spreading cast, with the hand fully expanded to make them spread out regularly; or performed with the hand locked, disseminating the seed from between the fore-finger and thumb,

thumb, which latter method is also proper for sowing on narrow borders, &c. and directly as soon as sowed, proceed to rake in the seed, but previously observing that if the ground is of a loose light temperament and dry, it is proper in garden-sowing first to tread down the seed evenly, with the feet moderately close, and taking short steps, which fixes it regularly, and not liable to be drawn in heaps in raking, and also prevents the ground sinking in holes under the feet when standing to rake in the seed; then having a largish wide-teethed rake, proceed to rake in the seed, by raking the ground all over evenly, only two or three strokes in a place, which is generally sufficient so as to bury the seed regularly a proper depth in the earth, clearing away as you go on, all large stones and any rough clods which does not break under the rake; being always careful to rake moderately, and equally in every place, just sufficient to bury the seed, and not draw it in heaps, leaving a level smooth surface.

But sometimes in broad-cast sowing any large spaces in extensive kitchen grounds, in late spring and in summer sowing, and in rough or light loose soils, that after raking or harrowing in the seed, it is of utility to roll the ground with a light wooden roller to smooth and close the surface more effectually over the seed, and that the plants may rise more evenly: also by its rendering the surface more even and compact, filling up the interstices, it
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in dry weather, defends the feeds and roots of the young plants, in their infant state, from the effects of the drought, and retains the proper moisture in the earth longer about the roots, to forward their vegetation in a free and regular process, according to the nature of growth of the respective crops.

Or sometimes in sowing large tracts of kitchen crops, in the broad-cast way, in extensive kitchen gardens or fields, they without treading in the seed as above advised in light soils, harrow it in with a small, short toothed harrow, and afterwards roll the ground with a wooden roller drawn by men or horses.

The above method of broad-cast, sowing in continued plats, may be occasionally practised for many of the principal kitchen crops, such as carrots, parsnips, turneps, onions, leeks, spinach, lettuce, and other sorts which commonly remain where sowed to attain perfection; also occasionally to various sorts for transplantation; likewise it may be practiced to several kinds of hardy flower seeds, sowing them in borders and raking them in, to raise the plants for transplanting into the flower and pleasure garden.

2. *By broad-cast sowing in beds, and raking in the seed.*

Broad-

Broad-cast sowing in beds and raking in the seed, is by either previously dividing the ground into three, four, five, or six feet-wide beds, or first sow the seed over the space of ground and then divide it into beds of the above width, with alleys or small paths between bed and bed, of from about nine or ten to fifteen or eighteen inches wide for the convenience of going between the beds to perform the necessary work, both of standing therein to sow the seed, especially in wet heavy ground without treading at all upon the beds, which in such soils would render the surface too compact and binding; also to stand in the alleys to weed, thin, water, and gather the crops; as likewise, in such particular sorts as require transplanting out into other compartments; can stand in the alleys to thin out or draw the young plants for that purpose, without either trampling the beds or the crops of the respective vegetables, whether esculents, flowers, or young trees, &c.

So that in this order of sowing seeds in beds, the ground being previously digged or trenched one or two spades deep, it may be formed into beds by treading out the alleys between bed and bed, evenly by line from the width of your two feet close together, to double, or treble that width, as may be required for particular sorts, making the edges of the bed straight, then standing in the alleys, sow the seed and rake
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it evenly, or previously, in some particular cases, before the seed is sowed, that if thought convenient in wet soils, to have the beds raised, and the alleys deepened an inch or two, you may with the spade, trim the earth evenly out of the bottom of each alley, one, two or three inches deep, and spread it over the beds; but this may also be sometimes practised after the seed is sowed, if of a large kind, as it will be thereby more effectually covered a regular depth in the ground, observing as below.

Always in preparing to sow, let the ground at the time be digged or fresh turned up, but not raked till after sowing the seed; only as you proceed in digging, break the surface moderately fine; and then may first divide the ground into beds of three, four or five feet for the reception of the seed, or may first sow the seed, all over the general surface, and then form the ground into proper beds as above, and sow the seed, in each method as below.

By the former of these two methods, first, set out the proper width of the beds, and by line tread out the alleys between bed and bed, of the width before hinted, then standing in the alley, sow the seed along each bed separately, with a locked hand, discharging it from between the fore-finger and thumb length-ways along the bed, in a spreading order regularly the whole width thereof, and as soon as sowed, either tread
down

down, evenly, as observed in common broadcast sowing, if a dry light loose soil, or not tread it at all if moist heavy ground, and, in either method, proceed directly to rake in the seed, or previous to this, if thought requisite for any large seed, you may with the spade, pare the earth in the bottom of the alleys, as before observed, going an inch or two deep, breaking the earth fine, and cast it evenly over the surface of the beds, serving to cover the seed more effectually, especially if of a large kind, though otherwise this is not absolutely necessary, nor even always for large seeds, if the surface of the ground lies somewhat roughish, and of a pliable nature, so as to admit of the seed being effectually buried a proper depth in raking. Observing in either method that in performing the raking-in the seed, may stand in the alleys as advised in sowing, and rake the beds length ways, with a steady even hand equally in every part, going only two or three strokes in a place, sufficient to bury the seed regularly in the earth a moderate depth without drawing it in heaps, as is often done by irregular raking, and raking too often in a place; being careful as you proceed, to clear off large stones and rough hard clods, finishing the surface of the beds even and smooth,

The above method of bed-sowing by first forming the ground into beds, may be practised occasionally both to all sorts of kitchen gar-

garden crops, and likewise in sowing flower seeds, and of most kinds of trees and shrubs.

But if intended to perform the bed-sowing by the other method, that is, that previous to forming the ground into beds, to sow the seed all over the general surface, and afterwards to mark out the beds four or five feet wide, or more, it may be eligible for many of the large crops of the kitchen garden plants in particular, as we before noticed, and in which let the seed be sowed over the general surface, either by disseminating it with the hand expanded at each cast, as before explained in the common broad-cast sowing, or with the hand shut, discharging the seeds from between the fore finger and the thumb in a spreading order, as also explained before; then tread out the beds and alleys the requisite width, by the rules before exhibited, and directly rake in the seed by standing in the alleys, especially if a moist heavy soil, that you may not trample the surface of the earth hard and binding, but if a dry light open soil, and quite dry weather, may previously tread down the seed, before raking it in, if thought more expedient in any particular sorts, to inter them more effectually in the earth; especially if any considerable kitchen garden crops; and is effected by treading the ground all over lightly and regularly, while the surface remains dry, not else, performing it with the feet

feet moderately close together, slipping them lightly along the surface by quick short steps, once only in a place; then proceed to rake in the seed directly; or previously, if a dry, light or pliable soil, and a large kind of seed sowed, you may, if thought eligible for any particular sort, pare the alleys with the spade two or three inches deep, breaking the earth small and cast it over the beds, evenly in every part, to cover the seed a more regular and effectual depth if required; and in either method, stand in the alley, and rake the beds length-ways with a regular steady hand, not to draw the earth or seed in heaps: clearing off with the rake, all large stones and dry stubborn clods, that will not yield to the raking; as observed in the former method of bed-sowing.

Sometimes in bed-sowing and raking in, that instead of treading down the seed, as advised to be performed occasionally in dry, light, loose soils, you may in rough stubborn ground, before raking in, first strike in the seed, with the back of the teeth of a large rake, in order to break the rough clods, over the seed, both that the ground may admit of raking more regular, and of the seed being more effectually raked in all an equal depth: and having thus struck in the seed, may if thought necessary, for any larger sorts, pare up the earth of the alleys with the spade, two or three inches deep or more, and spread

it evenly over the beds: and then directly rake the beds evenly lengthways; performing the whole by standing in the alleys, without trampling the beds hard, especially in a wet or binding soil, or at an early season, or in winter, when the ground is full of moisture, and in which cases, it is necessary to preserve the surface as loose and open as possible.

The above different methods of sowing in beds by raking in the seed, is calculated for the various sorts of kitchen garden crops when thought requisite to sow in beds, for the better convenience of doing the necessary work to the respective crops by standing in the alleys between the beds, without either trampling the surface hard and binding, or treading down or bruising the young plants with the feet; and for the same reason most of the hardy kinds of flower seeds both annuals, biennials, and perennials may be occasionally or generally sowed by the same methods; but more particularly by previously forming the ground into beds of proper width, and so stand in the alleys to sow the seeds, and rake them in; likewise by first setting out the beds, as above, for sowing bed and bed, and raking in the seed in the before mentioned method, may sow many sorts of small seeds of the hardy tree and shrub kinds: or of which, in some cases, that before raking in, some earth may
be

be cast out of the alleys, over the seeds, or the seed first beat into the ground with the back part of the teeth of the rake, and then the earth of the alleys cast over the beds, and afterwards rake them smooth lengthways. But see also *sowing in beds by covering in the seed with the rake and spade.*

It should be observed in general that in sowing in beds, it may be proper in all binding, wet or stubborn ground, to stand in the alley both to sow and rake in the seed; also in all early sowing, in winter or soon in spring, while the earth continues of a wettish binding temperature, it is advisable to sow in beds, and to perform both the sowing and raking in standing in the alleys, between the beds; for in all the above cases, it is of importance to preserve the surface of the bed, rather somewhat open and loose, that the young plants may be able to rise more easy and regular, which they will not so well effect, when in the above-mentioned cases of wet and binding soils, the surface is rendered compact and hard by trampling much upon the beds.

3. *By sowing in beds and covering in the seed, by drawing earth over it, out of the alleys.*

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The sowing of seed in beds and covering it in by drawing earth over it out of the alleys, previously trimmed off the bed for that purpose, is a very regular mode of sowing many sorts of seeds, in every department of gardening; and is performed, by first forming the ground when digged, into three or four feet wide beds with small furrows or paths between them, of from six or eight to ten or twelve inches width; then standing in the alleys with one foot before the other, and with the back of the rake turn the earth evenly from off the surface of the bed from about half an inch to one or two inches deep, into the alley opposite to that you stand in, forming it in a small ridge along the edge of the bed; then the seed is to be sowed evenly on the surface of the bed, and with the rake draw the earth out of the alley regularly on the bed again in a spreading order over the seed, so as to cover it all an equal depth, as is more fully explained below, in the proper place.

This is a very regular method of sowing the seeds of various sorts of the more curious kinds of plants and trees; as the seeds by this method of covering in, can be more regularly buried all an equal depth, as they may require according to their size, than by sowing on the rough surface and raking in; for, according to the nature, size, and substance of the several sorts of seeds, they can be sowed shallower or deeper, by drawing

ing a thinner or thicker depth of earth from off the surface, for covering them in the depth required; the smallest seeds requiring only a thin covering of earth, from a quarter to half an inch, and so on to one or two inches in the largest sizes of seeds.

But this method of sowing, is in some places, constantly practised as the general method for sowing all sorts of common seeds that are generally sowed in beds, such as most sorts of kitchen garden seeds, except those which are usually sowed in drills, as peas, beans, kidney beans, &c. likewise flower seeds, and most other hardy herbaceous plants that are either generally or occasionally raised from seed; and may, with great propriety, be practised in sowing almost any sorts of common seeds, except those requiring to be sowed in drills as aforesaid; though as this method of sowing is not so expeditious as sowing immediately on the rough surface, and raking in, the latter method is most eligible for general practice in sowing large spaces of kitchen garden crops particular; either broad-cast in one continued plat, or in beds, where necessary to use all possible expedition in this business: also for sowing any considerable quantities of the hardy flowering and other herbaceous plants in beds, in the most expeditious manner.

However

However for moderate quantities of seeds, both of the choicer kinds of plants, and of any of the kitchen esculents and flowers, as well as some small sorts of tree and shrub seeds, this method of bed sowing and covering in the seed by drawing the earth over it with the rake, may be very elegibly practised occasionally, or even generally in small gardens, for sowing any kinds of seed, if thought most convenient; it being a very regular and neat method of bed sowing, and by a little practice, may be performed with tolerable expedition, observing as follows.

The method is, let the ground be prepared for the reception of the seeds, by proper digging, trenching, or fresh turning over, &c. just at the time they are to be sowed; and as you advance in the digging, rake the ground well every six, eight, or ten feet, to break the clods, and make the soil moderately fine, and the surface smooth; then, having finished digging, &c. tread out the beds by line, three and a half or four feet wide, forming alleys between bed and bed, the width of your two feet or more; which done, then, with the back of the large garden rake, turned teeth upwards, and standing in the alley, proceed to shove off a covering of earth evenly, from the surface of the bed, into the opposite alley, from about half an inch to one or two inches or more deep,

deep, according to the size of the different sorts of seeds intended to be sowed, and covered in therewith, taking off only a slender or thin covering for small light seeds, and thicker in proportion for those of a larger size; being careful in shoving off the covering of earth, to form it evenly into a small ridge in the alley, close along the edge of the bed, ready for drawing it on again over the seed, forming the surface of the beds even and smooth; and in this manner proceed preparing the beds, ready for sowing, and either sow the seed, bed and bed, as you go on in preparing them as above, and cover in the seed, by drawing the earth over with the rake as explained below; or you may previously prepare all the beds, ready for sowing, as aforesaid, and then sow, and cover in bed and bed, according to the following method.

Having as above prepared one or more beds, by shoving off a covering of earth to one side, then standing in the first alley, sow the seed evenly over the surface of the adjoining bed, and then proceed to cover it in, by drawing the earth out of the alley evenly over it with the rake; beginning at one end of the bed, and with the rake teeth downwards strike it smartly into the further side of the ridge of earth which was trimmed off the surface of the bed, and with a jerk, draw it evenly on the bed over the seed in a spreading order, regularly from

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One side of the bed to the other, so as to cover the seeds all an equal depth, less or more, according to the depth of the covering of earth, shovelled off the bed for that purpose, as the size of the seeds require, taking the length of the head of the rake, at each stroke, or draw regularly from one end to the other of the bed, till all the seed is evenly covered in with the earth; and then with a light rake, let the surface of each bed be lightly smoothed, and cleared from all stones, and rough, hard clods, being careful in the raking, not to rake deep but as superficially or light as possible, just to smooth the surface.

But sometimes in sowing large seeds, kernels, berries, nuts, acorns, stones, &c. by this method of sowing in beds and covering in with the rake, it may be proper just after sowing the seed, and before covering it over, first with the back of the spade to press or lightly beat the seeds, &c. evenly down into the earth, level with the surface thereof, to fix them properly, not to be removed or displaced irregularly by drawing the earth over them, and that they may be more effectually and regularly covered the proper depth in the earth required; and having thus beat them down even, then with the rake, draw the earth over them equally in the manner just above directed, and lightly rake the surface smooth.

This is also sometimes practised occasionally in sowing small light seeds of any choice plants, or in very dry weather, for any particular sorts; the beds being prepared as above directed by raking them fine, and then shoving off a slight covering of earth to one side of the bed, sow the seed, and smooth them down with the back of the spade; and with the rake draw the earth over them, and smooth the surface with a very light raking.

Also sometimes in sowing very small or light seeds, of any choice kinds of plants, that after having trimmed off a slender covering of earth from the surface of the bed ready for covering over the seed after sowing, may first smooth the surface lightly over with the back of a spade, and then sow the seed, and touch it gently down also with the back of the spade, and cover it in as above, by raking the earth over, and slightly trim the surface smooth with the rake, as before advised.

Thus, by one or other of the above methods sowing in beds, and covering in the seeds by raking the earth over them. Almost any sorts of seeds may be occasionally sowed if thought expedient: observing the first of these methods may be the most eligible for any of the common seeds, of the smaller or middling size, the second method will be very effectual in sowing all sorts of large seeds, berries,

berries, nuts, &c. both of any kinds of herbaceous plants, either esculents or flowers, as also of the tree and shrub kinds, likewise occasionally in sowing very small light seeds; and the third method may be occasionally practised to advantage in sowing some of the more curious kinds of very small seeds, especially in a light dry soil, in very dry weather.

4. *By sowing in beds and covering in with the spade, &c.*

The sowing in beds and covering in the seeds, by casting earth over them out of the alleys, &c. with the spade, is practised in sowing several sorts of the large kinds of seeds, acorns, nuts, &c. and is effected two or three different ways; such as either by previously drawing a covering of earth off the surface of the bed into the furrow, or alley between, ready to cast over the seeds; or, having wide alleys, use the earth thereof for casting over the seed without drawing any off the bed for that purpose, which latter method proves eligible also in cases of wet soils, when sowing early, or in winter, &c. as it raises the beds a little, and sinks the alleys to drain off the redundant moisture from the beds more effectually if required; and each of these methods may be practised occasionally, as it shall seem expedient, both in nursery gardens, in sowing various tree and shrub seeds, of the larger sorts,

especially of the acorn, nut, stone, and mast kinds; also for kernels and berries; likewise occasionally in sowing some large seeds of the kitchen garden and flower tribe, either when by the largeness of the seeds, or the soil not being pliable to the rake, it is judged they can be more regular and effectually covered a proper depth than by raking in, or by drawing earth over them with the rake; also in some soils in bed sowing, at an early season, when the ground is so wet and impliable, that it will not yield to the rake, to admit of raking in proper order, this method of sowing any large seeds, immediately on the rough surface of the bed, beating it in with the teeth of the rake, and then covering in with earth out of the alleys, being previously broken small with the spade, and therewith spread over the beds; may prove more successful than any of the other ways of sowing.

The methods are as follow:

The ground to be properly digged or trenched, &c. one or two spades deep, breaking all large clods and lay the surface even: then marked out, by line, in three and a half or four feet wide beds, with foot wide, or fifteen or eighteen inch alleys between bed and bed; which done proceed to sow by either of the following methods, that is, either by first trimming or drawing off a covering of earth, from the surface of the bed,

bed, with the spade or rake, a proper depth into the alleys, ready to spread on again over the seed when sowed: or by sowing immediately on the rough surface without previously drawing off any covering of earth from the bed, but to cover entirely with the earth of the alley pared up a proper depth with the spade.

The former of these methods is proper in sowing various sorts of larger seeds, and particularly many sorts of tree and shrub seeds, kernels, nuts, stones, berries, mast, &c. let a covering of earth be trimmed evenly from off the surface of the bed, with the spade or rake into the alley, from one to two inches deep or more, for those of the large nut or stone kind particularly, going an equal depth in every part of the bed, forming the top perfectly even for the reception of the seed; then sow the seed, &c. evenly over the whole bed, thicker or thinner, according to what they are; and then with the back of a spade press all the seeds evenly down into the earth of the bed, level with the surface thereof: this done, let them be directly covered in with the earth, which for that purpose was drawn off the surface of the bed into the alley, trimming it up evenly with the spade, and cast it in a spreading order, evenly over the bed, so as to cover the seeds all an equal depth, according to the depth of earth, previously drawn off the bed for covering them in, thinner or thick-

er, proportionally to the size of the different sorts; as before intimated. And when the beds are thus all sowed and covered in, let the surface of each be very lightly raked length ways, just to trim off any largish stones and rough clods, and smooth the top evenly in a neat manner.

The other method of sowing in beds and covering in with the spade, is either by sowing immediately on the rough surface of the bed, or the surface previously raked smooth, without previously drawing any covering of earth off the bed, for covering in the seed, but to cover entirely with the earth trimmed up in the alley: and may be eligibly practised for any kind of middling size seed, both occasionally of the esculents of the kitchen garden, flowers and trees, &c. where the seeds require only a moderate covering of earth, such as from half an inch to an inch deep, observe as below.

Let the ground be properly digged or trenched, and divided into beds; then, as before observed, without drawing off any covering of earth from the surface of the bed, for covering in the seed after sowing, as in the former method, let the seed be sowed either immediately on the rough surface, and directly, with the back of the teeth of the rake, strike the seeds evenly into the surface of the bed, then with the spade trim up the earth of the alley, break it moderately fine, and spread
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it on the bed over the seeds from half an inch to an inch deep, and rake the surface even and smooth; or, previous to sowing, may first rake the beds fine, sow the seeds, and with the spade cast a covering of earth out of the alleys over them the proper depth, or also before covering in, particularly if large seed, may first pat them down gently into the earth of the bed even with the surface, and then pare up the alleys, and spread the earth over the seeds the depth required, from half an inch to an inch deep: and with the rake run over the beds very lightly to smooth the surface.

5. *Sowing seed in beds and covering in, by sifting earth over the seed.*

The sowing in beds and covering in the seeds, by sifting earth over them out of a sieve, is practised only occasionally in sowing any very small or light seeds, either of any particularly curious sorts of plants, or of such as require to be very thinly covered, and may be performed both to hardy seeds in beds in the open ground, and in hot beds, pots, boxes, &c. such as any very fine seeds of choice flowers, and other curious plants, which require to be only just covered, or not more than from half a quarter to a quarter of an inch deep, also occasionally in some esculents, at certain seasons, as in early small salad seeds,

especially when sowing them in hot-beds, all over the surface to make the most of every space thereof, or in garden frames without any heat, likewise sometimes in the full ground, in beds and borders, in early sowing in the spring, when sowing over the general surface of the bed; and sometimes also in sowing in drills; for these seeds requiring only a very slight covering of earth, especially in the early sowings, both in winter and spring, that if but just covered at these early seasons, they will come up considerably quicker and more regular together, than if covered deeper; so that for these kinds sowed fully over the general surface, the covering them in by sifting earth lightly over, out of a sieve, is a very eligible method both for early and late sowing, though more particularly so in early crops; the same method is also eligible in sowing some other sorts of small kitchen garden seeds early in hot-beds, or in frames, all over the general surface: and of various other sorts of seeds, when necessary to forward them by sowing in the like compartments in the same order, by the general method hereunder directed.

In this method of sowing, let a bed or beds of fine light earth, be prepared by proper digging and raking the soil as fine as possible, and the surface made even and smooth, also if in hot-beds, or any compartments under garden frames, &c. let the
same

same method be observed, and in either of these compartments, prepared as above, that if for any very fine light seed, or small fallading, &c. you may also previous to the sowing, gently smooth down the surface with the back of the spade, or otherwise this may be performed after the seed is sowed, as directed below.

Having thus prepared the beds for sowing by sifting in, let the seed be sowed evenly all over the surface the proper thickness: observing that all seeds whatsoever, except those of small fallading, should only be sowed moderately thick; but for the fallading it is proper to sow it very thick, even as almost wholly to cover the surface of the bed, for as the plants thereof are to be cut up for use when very small, only a few days old, that if not sowed exceedingly thick they would not afford any produce worth the trouble of sowing, &c. then as soon as the seeds of any sorts are thus sowed, you may, before sifting the earth over, lightly smooth them down into the earth of the bed with the back of the spade, even with the surface, and directly cover them in, either by sifting earth over out of the alleys, if the soil is perfectly light, loose and fine, or bring a quantity of fine light earth in a wheel-barrow, &c. and in either method, being provided with a fine garden wire sieve, break the earth fine, fill it therein, and sift it evenly

evenly over the seed a slender depth for the small fine seeds, and thicker in proportion for those of a larger substance; generally covering it from about half a quarter of an inch or less, in very fine seeds, to a quarter or half an inch in larger kinds.

Or in sowing by this method of covering in the seeds by sifting earth over them, that after raking the soil fine in each bed, you may before sowing, draw a sufficiency of the fine earth from off the surface of the bed into the alley, ready to sift over the seed when sowed, observing the same rules as above.

And in sowing any small portion of seeds in pots or boxes, &c. that having filled them with fine mold within an inch or half an inch of the top, make the surface even and smooth, sow the seed, and sift the earth over it the proper depth as above directed; or it may be covered in by scattering sifted, or finely broken earth over them with the hand. See the article *sowing in pots; &c.*

6. *By sowing in drills by different methods..*

The sowing in drills drawn with an hoe from half an inch to one, two, or three inches deep, as different sorts of seed require, is a very eligible method of sowing various sorts of seed, both of the kitchen
gar-

garden, flower garden, and for many sorts of tree seeds, &c. and may be practised to particular advantage in sowing many of the larger kinds of seeds, kernels, stones, nuts, acorns, berries, mast, &c. as mentioned in some of the other methods of sowing, it being a very regular way of sowing such kinds so as to cover them all an equal depth.

Or the sowing in drills may be practised occasionally for sowing many sorts of the common seeds, both large, small, or middling; particularly of numerous sorts of the herbaceous tribe of plants; both to remain to attain perfection, as in many of the esculents of the kitchen garden, such as peas, beans, kidney beans; sometimes spinach, beet, parsley, chervil, small-sallading, coriander, purslane, finochia, and dill, with several others which succeed both by drill-sowing, and in broad cast on the surface: also sometimes for transplantation, in several sorts of the transplanting kinds, when thought expedient by way of experiment, such as endive, lettuce, celery, cardoons, asparagus, leeks, cucumber, sorrel, burnet, marjoram, hyssop, thyme, &c. likewise for experiment, sometimes seeds of several of the esculent roots are also sowed in wide drills, such as parsnip, carrot, redbeet, farsafy, scorzonera, skirret, large-rooted parsley, turnep, radish, &c. all to remain where sowed, and the plants thinned out to proper distances; though as this is not advised for the general practice,
yet

yet it may be practised occasionally to good advantage, if we are careful to thin the plants of such as require it, in due time in their early growth.

However, in the kitchen garden, the sowing in drills for general practice, is particularly requisite for all sorts of peas, beans, and kidney beans, for these will not succeed by any other order of sowing: likewise parsley should mostly be sowed in drills, both as an edging and in continued rows; also small fallading, in the full ground particularly, should principally be sowed in shallow flat drills; though by sowing several other sorts in drills, it affords more scope of growth to the plants, and admits of more readily weeding and other culture between the rows.

Likewise many sorts of the flowery plants may also be very eligibly sowed in drills, some sorts to remain as in several of the annual kinds, such as Virginian stock, Venus navel-wort, and Venus looking-glass, nigella, pansies, candy-tufts, and many other dwarf kinds, when designed by way of edgings to beds or borders: also any other annual sorts, when intended they shall be cultivated in rows, either ranging along the front, back, or middle of beds or borders, or in several rows together, it is proper to sow them in flat shallow drills, to remain in that order to flower: and likewise many sorts both of annuals, biennials, and perennials,

of

of the hardy herbaceous kinds, may, with good propriety, be sowed in flat shallow drills for transplanting into other different compartments, where intended they shall flower; and thus by drill-sowing any of these sorts occasionally, it affords an opportunity of sowing any very small, or curious seeds evenly, as shallow a depth as required; and large seeds may also all be very regularly sowed to any requisite depth, and equally covered in with the necessary thickness of earth, with the greatest exactness and expedition, and admits of room between the rows to weed, water, and to hoe and stir the surface of the earth about the plants, to encourage their growth; as also for the more readily thinning or drawing out any particular sorts for transplantation.

And for the tree and shrub kinds, the sowing in drills is most eligible in all the nut, stone, and acorn tribe, and other large seeds or berries, for transplanting at a year or two old, as by raising the plants in rows, at moderate distances, it affords them both more air and scope to grow, and admits of cultivating the soil between them in weeding and hoeing to stir the earth, to promote a free growth, and of their being more conveniently drawn or thinned out for planting out in nursery rows, to remain for training to the proper size for the purposes for which they are calculated and intended.

Drill

Drill-sowing is performed by drawing the drills with a common garden hoe, either large, middling, or small-sized, according as may be required; and may sometimes be drawn with the corner of the hoe, to form a deep or narrow drill; and sometimes with the edge of the hoe, flat ways, to form a broad or shallow drill, each of which as may be required for larger or smaller seed; tho' the most general method, especially for the larger sorts of seeds, is by drawing the drill with the corner of the hoe held downwards, forming the drill angular-bottomed, from about one to two or three inches deep; and occasionally for smaller feeds may draw drills with the edge of the hoe held horizontally, or level with the surface of the earth, forming flat-bottomed, broad shallow drills, of from a quarter or half an inch, to about an inch or two deep; observing generally, in either method, the larger the seed, the deeper the drill should be in proportion, though, for the middling-large kinds, either of seeds, nuts, acorns, berries, stones, &c. about one or two inches depth is sufficient; and two or three inches, at most, is enough for the largest sorts, such as garden beans, walnuts, and chesnuts; and four or five inches deep for planting potatoe and Jerusalem artichoke sets.

And as to the distance between the drills, it may be from three or four inches to so many feet; that for feeds of small plants,

which

which neither grow tall nor spreading, from three to six, eight, ten, or twelve inches distance, may be a proper distance: but in peas, beans, and kidney beans, they require the drills to be from two or three to four feet and a half asunder, according to the degree of growth the different varieties thereof assume, some being small or but moderate growers, others attain a large growth; and in the tree and shrub seeds, the drills from six or eight to ten or twelve inches will be sufficient distance, when only to raise the plants of a year or two old for transplanting.

Drill sowing may either be occasionally in continued rows, in large spaces of ground for considerable crops; or the ground formed into beds, and the drills drawn across or length-ways, for any small parcels of seeds, or for small crops, or of any moderate-growing plants, or in borders by the same method. But in sowing large parcels of any considerable crops of esculents in drills, such as peas, beans, kidney beans, &c. they may be sowed in large quarters of ground in continued rows; or in drill-sowing of flower-seeds, it is proper to sow in beds or borders in cross drills, especially when designed to transplant them; but if to stand to flower where sowed, may either be sowed in cross drills, or long-ways; and in drill-sowing tree and shrub seed in nurseries for transplanting, it is proper generally to sow in beds of three or four feet wide, in drills cross-ways; but if intended

intended to sow any forest-tree seeds in fields, &c. for a standing plantation not to be removed, sow in continued drills the whole width or length of the ground at three, four, or five feet distance; and the plants to be gradually thinned.

As to the general methods of performing the sowing in drills, the ground is to be digged or trenched one or two spades deep; and if for sowing any very small light seeds, it may be advisable either to rake it fine as you advance in digging, or afterwards, when the ground is formed in a bed, or beds, or in a border; but for any middling or large seed, the raking is not always necessary, except in very rough impliable soils: and in drawing the drills generally have a line by which to draw them straight, especially if for any considerable length.

If for large seeds, such as the pea, bean, kidney bean, acorns, nuts, stones, berries, or any other largish sorts, either of the kitchen garden, or any flower or tree seeds, &c. intended to be sowed in drills, the drills may generally be drawn angular-ways, with the corner of a common garden hoe, forming thereby deepish drills in the following manner; observing in the first place, if the drills are intended of any considerable length as before hinted, to set a line as a guide whereby to draw them straight and even: then proceed to draw the drills, holding the hoe corner-

corner-ways to the earth, with the edge close to the line, a little flanting, and with the low-corner draw the drill in the ground, from one to two or three inches depth, as may be required; and so proceed drill and drill, at a proper distance from one another, till the whole you intend is opened; then sow or scatter the feeds evenly along the bottom: or, if of the large kinds, such as beans, acorns, nuts, stones, &c. place them regularly in a row along the bottom, at small distances, from two or three, to four, five, or six inches; and either with a hoe or rake, draw the earth over them all a regular depth: or in sowing peas, beans, or kidney beans, the earth may be turned in over the feed with your feet, by slipping them lightly along, one on each side of the drill, turning in the earth with both feet alternately; or in drill-sowing any small portion of fine feed in a bed or border, or along an edging, may cover in the earth lightly with the hand, by either breaking fine the earth drawn out of the drill, or some fine mold brought, and spread it evenly over the feeds; and when in either method the feed is covered in, it is eligible, in any principal or choice kinds particularly, to lightly rake along the drills and between them, to break any rough clods, clear off stones, and form a level smooth surface, neat and decent to the sight, and that the plants may rise more evenly in a regular manner.

The

The above method of sowing in angular narrow-bottomed deepish drills, may be adopted for all the pea, bean, kidney bean, and such others of the pulse and legumen tribe, and other similar large seeds, that are usually or occasionally sowed in drills, both of the herbaceous, and tree, and shrub kinds; also occasionally for kernels, stones, nuts, acorns, &c. as we formerly suggested.

But flat-bottomed shallow drills is adapted for smaller kinds of seeds than the above-mentioned; such as for sowing any common seeds, from the smallest kinds to the middling large size, that may be necessary to sow occasionally in drills, and that require but a moderate covering of earth, and for which you may with the hoe held with the edge horizontally, as before hinted, draw flat shallow broadish drills, the whole width of any middling or small hoe, as may be required for the particular kinds of seeds; observing, that for long drills you should place your garden-line as a direction to draw them regular and straight; then with the hoe held with its edge horizontal, as aforesaid, or parallel with the surface of the ground, draw therewith in that position drills in the earth the full width of the hoe, as above observed, from about a quarter or half an inch, to an inch deep or more; making the bottom equally level the whole width, going shallower or deeper, in proportion to the size of the seeds: which then sow evenly along the bottom of the drill the whole

width thereof; and then with the rake, or hoe, or hand, as may seem most convenient, trim in the earth on each side of the drill evenly over the seed the proper depth, according to that of the drill: or sometimes in sowing very fine, or small light seeds, in quite shallow drills, in beds, borders, or along an edging, &c. and that the earth thereof is rather rough, cloddy, or too impliable to cover it in properly, it may be eligible to bring some finely-broken mould, or some that has been sifted, and strew it thinly over the seed with your hand. As soon as the sowing and covering-in is effected, in either method, then with a light rake run it as lightly as possible over the surface, to smooth it off evenly.

By the above method of sowing in flat drills, may be sowed various sorts of smaller and middling-sized seeds, both of the kitchen and flower garden, of such as may be eligible to sow occasionally in drills; also many sorts of the smaller seeds of trees and shrubs, &c.

But sometimes in drill-sowing in gardens, it is performed by making flat drills with a spade for some kinds of large seed, such as early beans, peas, or kidney-beans, &c. for transplanting; holding the spade with the back level with the earth, and length-ways the way of the intended drill, and in that position pare out the earth of the drill to the width of the spade by one, two, or three inches deep: and when one drill is thus formed,

formed, sow the seed intended; then opening another drill six inches or a foot distance, turning the earth thereof into the first upon the seed, then sowing this second drill, and cover it in with the earth out of the third, and so on to the end; which method is sometimes practised in sowing some large nut kinds, acorns, mast, &c. and occasionally in sowing early garden beans for transplanting.

Sometimes also when required to sow any small seeds in narrow shallow drills, in beds, borders, or along the edge thereof for an edging, that instead of an hoe, or in default thereof, in dry, light, pliable ground, it may occasionally be performed with a flat-ended stick, an inch and half, or two inches broad; and especially if the ground is previously raked, you may with facility draw neat drills therewith, of from a quarter or half an inch, to one or two inches deep: sow the seed along the bottom, and either rake the earth over it the proper depth, or cover it over with the hand or hoe, as it may seem most eligible, so as to have the earth as fine as possible over the seed; or if the earth of the place is rather roughish, cloddy, or impliable to break small, may for any small sowing bring some other finely broken or sifted earth, and strew it out of the hand over the seed the depth required. Likewise in drill-sowing any kind of seeds in hot-beds, in small parcels, the drills may occasionally be made either with a small one

or two inch hoe, or with the end of the finger or two fingers close together; or the end of a small flat-ended stick, drawing the drills from two or three, to five or six inches asunder, according to the nature of growth of the different kinds, sow the seeds therein, and cover them over with fine mold the depth of the drill.

7. *By sowing seed in hot-beds and frames, &c.*

By aid of hot beds many sorts of seeds of tender plants, may be sowed to forward their vegetation, that will not grow at all or but very reluctantly without that assistance; also seeds of various hardy plants, by being sowed in hot beds, early in spring, it will forward both the germination of the seeds and the growth of the respective plants, advancing them sometimes a month or two sooner to perfection for the purposes intended, than those of the same sorts in the natural ground, so that the propagation by seed sowed in hot beds, may be practised to particular advantage in sowing small parcels of those of any desirable plants both of the tender and hardy kinds, as aforesaid, either any of the green house and hot house exotics, any choice flower seeds, some of the more curious and delicate sorts of tree seeds, particularly some of the evergreen kinds; and likewise many sorts of the esculent tribe of the kitchen garden, such as

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cucumbers, both for early and the principal summer crops; and melons never attain perfection in England without the aid of artificial heat; likewise early small fallading, early radishes, and several other kitchen plants, may be acquired at an early season, by sowing the seed in hot beds, and by which they are often obtained several weeks before their natural season, and in some sorts several months, as in cucumbers and melons.

So that for all of which sorts of plants, &c. requiring to be forwarded either generally or occasionally in hot beds, &c. the said beds may either be of fresh hot horse stable dung, the moist litter and horse droppings together, as the common and most easily obtained hot beds, or of tanner's bark, commonly called bark beds, as the most regular and durable in their heat; and each of which being defended with garden frames and glasses, or other shelters, and earthed with fine light mold, six or eight inches deep, forming the surface even and smooth, are then ready for the reception of any sorts of seeds intended,

Thus the seeds may either be sowed all over the surface, if all of one sort, or, if different kinds, sowed in compartments separately in the same bed, and in each method earthed in, by sifting fine mold over out of a sieve, from half a quarter, to a quarter or half an inch deep, as required according to the nature and size of the seed,

or

or by strewing fine earth by hand over the seed the same depth, also by drawing small shallow drills, by the methods before advised in the article of *drill-sowing in hot beds*. See *drill-sowing*.

Likewise when without any artificial heat, it is intended to perform the sowing of seed in beds of natural earth, defended with frames and glassess, to bring them a little forwarder by a week or two than in the full open ground, the same method of sowing may be observed as just above advised.

8. *By sowing seed in pots, boxes, &c.*

In many of the more curious flower and tree and shrub seed, both some of the more delicate sorts in the open ground, and of the tender kinds of the green-house and stove plants, in which only small quantities are generally raised from seeds, it is eligible to sow them in pots or boxes of light earth, for the greater convenience of placing them, in different situations as they may require, either in the shade, sun, or shelter, or in a hot bed, under frames, &c. or in the hot house, when necessary to forward any sorts as much as possible in their early state, or that others not requiring a hot bed, or that after being forwarded at first by that aid, they may be removed, as occasion requires, to shelter in cold weather, and to the shade in summer; for several kinds of curious vegetables, although tolerably

lerably hardy, in their advanced state, yet in their infant growth, require to be tenderly treated.

The pots or boxes for this method of propagation by seed, may either be of the large, middling or smaller size, according to the quantity of seeds to be sowed, one hot bed may serve for small quantities of several different sorts of seed, but generally sow only one sort in each pot or box, which let be filled with finely broken light earth, smooth the surface, sow the seed thereon evenly, then either sift earth over a moderate thickness as required, or scatter fine mold over with the hand.

Then place the pots where intended, either in the open ground, in sunny or shady situations, as required, or in a hot-bed, hot-house, &c. if seeds of tender plants that require such aids, or if of hardy kinds, which you intend forwarding thereby, or under garden frames and glasses, green-house, or any place of shelter, or shade, &c. according as the nature, or temperature of the different seeds shall require, as also that of the season of the year, whether cold weather in winter and early spring, or warm and hot in summer and autumn, agreeable to the rules just above intimated.

By the sowing in pots, they can be easily moved to any place as above, or to different situations at different seasons;—as for example, if early in spring, the seed pots of any
choice

choice hardy plants are placed in a warm sunny border, or in hot-beds, &c. to forward them, they can at the approach of hot summer weather, be removed out of the sun to the shade, and to shelter in winter, or from one hot-bed to another, or from that to the open air; or any tender green-house kinds, sowed in pots and plunged in a hot-bed, &c. can be gradually hardened in a moderate way, as required, by removing the pots by degrees more or less, to the full air in summer; and those of the more tender exotics of a stove can be removed occasionally either to a greater or more moderate degree of heat in any hot-bed or hot-house, &c. by either plunging the seed-pots in a hot-bed or bark-bed, or not plunging them at all, according as the heat is either moderate or strong, or removing them from a warmer interior part in a hot-house, &c. to a place of more moderate heat, in the front or ends when necessary, and so *vice versa*, or from a hot-house to a green-house or under frames, or to the full air, as the case requires, both of such seeds and plants of those temperatures as are generally placed in hot-houses, and those of a more hardy nature, that are occasionally placed therein, to forward the germination of the seed, and growth of the plants to a certain degree.

9. *By seed sowed in patches about the borders.*

In sowing several sorts of hardy annual flowers, which can be propagated only by seed, and sowed at once where they are finally to remain to blow, not requiring or succeeding by transplanting, it is eligible to sow the seed in small patches of a few inches diameter about the different borders of the pleasure ground, &c. such as in candy tuft, larkspur, lupins, nigella, and almost all the class of hardy annuals, some requiring to be sowed thick, as in the smaller and dwarf-growing kinds, and that produce but smallish flowers, in order that they may rise in clusters, and form a tufty or bushy growth, that the flowers being many together, may appear conspicuous; others of a larger growth, require to be sowed thinner in the patches, and others of the largest size, such as sun flowers, &c. should be sowed only two or three seeds in each patch, and of the sun flower in particular, leave only one plant in a place by thinning out the weakest when they come up.

This method of sowing hardy annual flowers in small patches, dispersed about the borders in assemblage with other flowery plants, is the most adviseable order of culture, in which the plants effect the best appearance when in flower, by rising in bunches in diversified variety among the other flowery tribe, as well as with one

another

another in different sorts, and the sowing thus, is very expeditiously performed without the plants requiring any farther trouble of transplanting.

But besides the above, several of the esculents of the kitchen garden are occasionally propagated by sowing in patches, such as cucumbers in the open ground, for picklers, require sowing in patches or shallow holes, in rows five or six feet asunder, also cardoons occasionally in a similar manner, sowing them at once, to remain so as not to give them any future check by removal, sometimes also asparagus, when designed to form a plantation thereof, by sowing the seed at once where the plants are to remain.

However in regard to the order of sowing the hardy annual flowers in patches, observe these may be from three or four, to five or six inches or more broad, disposed in some regularity with respect to the growth of the respective plants, proceeding from within a foot of the front of the border, &c. where the seeds of the lowest growth should be sowed, and continued in some regular gradation, as near as can be judged to the tallest in the middle, and back part, not having the patches in regular rows, which would be too formal, but somewhat in an easy promiscuous arrangement, at the distance of from three or four to five or six feet, less or more, as shall be thought expedient, ac-

cording to the size and situation of the borders, and other compartments they are designed to adorn.

The method is, having the borders, beds, &c. previously digged in the spring and raked even, then having the seeds of the several sorts of hardy annuals that are intended, and a garden trowel or small spade, with which to loosen the soil if necessary, where the patches are to be formed; or in a light loose earth, that work may be performed with the hand only; so that in either method, let the earth be stirred up a few inches, to loosen and break the soil smallish, then form the patch just a little hollowish, not more than perceptible, of the width as before observed, of only a few inches, and prepare to sow the seed directly patch and patch, each separately as soon as formed, by drawing a little of the earth to one side, from a quarter or half an inch, to an inch deep, according to the smaller, middling, and larger seeds, and either drawing it off the whole width of the patch, if for having a more spreading tuft of low-growing plants, or only take out a little of the middle earth, if for taller growing annuals; directly sow the seed thicker or thinner according to the growth of the plants, by the rules before exhibited, and draw the earth over the seed, the proper depth, forming the surface smooth, and place a small piece of stick or twig as a mark to each patch sowed;

sowed; observing that only one sort of seed must be sowed in the same patch, and the patches of the several sorts must be properly disposed in a diversified order; that is, let no two or more patches of the same sort of seed be immediately next one another, or too near together, but let the different sorts be dispersed in separate patches, intermixed in such order as that the respective plants, when in flower, may effect a distinguishable variety of different colours, forms and sizes of the flowers, &c.

All the sorts of flowers thus sowed in patches are principally intended to remain in the same places to attain their flowering state and ripen the seed: only observing when the plants come up, those that are too crowded must be thinned as they require, the common sorts as candy tuft, Venus-navel-wort, Venus-looking-glass, lobels, catchfly. and the like dwarf sorts may remain moderately close to form a tufty growth, but thin the larger sorts more in proportion, but of the larger kinds such as the sun flower, and persicarias, leave only one plant in each patch; giving water as soon as thinned to settle the earth.

If required to make good the deficiency of any vacant parts, some of those thinned out, if in rainy weather, and having tolerable fibrey roots, may be planted in such places and watered, they will succeed.

As to the method of sowing the seeds of any esculent plants in patches, such as for pickling cucumbers, cardoons, and asparagus, as before suggested, is in the following manner.

First, as to cucumbers for pickling; they, for that purpose, are always sowed in the natural ground, in the end of May and beginning of June, in patches or holes at a yard distance in the rows, and five or six feet between the rows; at which distances let patches or holes be digged, or the earth well loosened and broken fine with a spade, or garden trowel, in widths of twelve or fifteen inches, forming them a little hollowish in the middle; then with the hand draw aside a little of the middle earth, three inches width, and half an inch or a little more deep; directly sow eight or ten seeds therein, and earth them over the above depth, and so proceed sowing as many holes or patches as intended.

When the cucumber-plants are come up a week or fortnight, thin them to four of the stoutest in each patch, and earth up the shanks, and give water.

Cardoons being also sometimes sowed in patches in shallow holes, in order that, as being large rampant growing plants, they, by remaining where sowed, are not disturbed by removal, will prove of more successful growth than when transplanted, as is practised when the seed is sowed for that
 3 purpose

purpose in small spaces of ground; so that to sow them in patches at once where they are for good to remain, let spaces of a foot or fifteen inches width be digged, break the earth fine, and form it hollow, allowing three or four feet distance between the holes or patches in each row, and the rows a yard and half asunder; and in the middle of each hole or patch sow three or four seeds, half an inch deep; though when the plants come up, and are advanced two or three inches in growth, thin out the weakest, leaving only one of the strongest in each patch.

Asparagus, when intended to make a fresh plantation thereof, the seed is sometimes sowed at once where the plants are finally to remain to yield their produce; in order that the seedlings remaining where sowed, they receive no after-check, as when transplanted from one place to another; and the method of sowing the seed for this purpose, is in small patches in rows, the distance as in making a plantation with plants.

The ground is to be dunged and trenched, divided into beds four feet and half wide, and raked smooth; then drawing lines a foot asunder length-ways the beds, proceed to put in the seed, in small patches along each line ten or twelve inches asunder; so at each patch opening a small aperture with the ends of the fingers, an inch deep, and two or three inches wide, drop three seeds in each hole, and earth them over; and so proceed.

ceed till the whole is sowed: and when the asparagus plants are come up about two inches high, let them be thinned, leaving only one of the best plants in each patch; which must remain to attain perfection, without any removal or transplantation.

10. *Sowing by dotting or dibbling in the seed.*

The sowing of seed by dibbling it in with a dibble, is only practised to some particular sorts, such as in planting garden beans; sometimes also scarlet and large white kidney beans, red beet, and some other large seeds occasionally, such as any of the large nut or stone kinds.

For this purpose should have a thick blunt end dibble, to make a hole wide enough quite to the bottom, that the seed may fall plump down, without any vacancy under it.

That in planting broad beans, make the holes not more than two or three inches deep, and from three to five or six inches distance, so dropping one bean in each hole; with one hand make the hole with the dibble, and with the other directly drop in the bean, and striking the earth in upon it also with the dibble; and when one row is planted, run your foot lightly along the row, filling in the holes completely over the beans; allowing from two feet and a half to a yard between the rows.

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But in planting kidney beans by dibble, make the holes only about an inch, or inch and half deep, and three inches asunder in the rows: or if sowed in patches about the borders, may dot in three or more beans in a small patch together.

And in planting any large nut or stone kinds by dibble, dot holes therewith for their reception, an inch and half, or two inches deep, and three inches asunder; drop one nut, &c. in each hole, and cover it in with the earth.

Sometimes also in sowing any large sort of hardy annual flower seeds in patches about the borders; it is effected by dotting them in, by making holes with a dibble an inch or two deep, and may be practised for nasturtiums, sweet peas, lupines, scarlet beans, sun-flowers, and other large sorts of seeds.

Likewise in the kitchen garden, in sowing the red beet, which is a large seed, and the plant requires to stand a foot distance, to give full scope for the root to attain a large size, it is sometimes dotted in by the dibble an inch deep, dropping two or three seeds in each hole, the holes ten inches, or a foot distant in the row; and when the plants are an inch high, then cut or pull all away but one good plant in each patch.

Also, in making plantations of asparagus, instead of putting in plants, sow the seed at once to remain, as observed in sowing seed
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in patches : it is sometimes put in by dotting it in by dibble, having first formed the ground into beds, four and a half feet wide, and drawing lines a foot asunder ; then having a thick blunt-ended dibble, make holes therewith an inch deep, and ten or twelve inches apart ; drop three seeds in each hole, and strike the earth upon the seeds ; and thus proceed dotting in the seed, hole and hole, separately ; and, when finished, rake the beds smooth.

Observe, when the asparagus plants are come up an inch or two high, thin them to one good plant in each hole.

II. *Propagation of bulbous and tuberous-rooted flowers by seed.*

Of the propagation of the bulbous-rooted flowers from seed, the varieties of the different species were all first accidentally obtained from seedling plants, and by which the varieties of some sorts are still considerably increased in number ; such as in tulip, hyacinths, polyanthus-narcissus, crown-imperials, colchicums, crocus, &c. and whose varieties, in the two former particularly, amount to some hundreds, and additional new ones are annually obtained by the florists, who are curious enough to sow some seed every year for that purpose.

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When new varieties are thus procured, possessing eligible properties, they are easily multiplied, and their respective properties continued always invariably the same, by propagating them by off-set young bulbs, &c. of the root, which the large bulbs afford in abundance annually, and which produce flowers alike in all respects to those of the parent; and thus they are multiplied annually: for the seed of the same plants will not again produce flowers like those of the mother variety, but sport in a diversity of other sorts, differing in size, colour, stripes, and variegations, &c. from the original; some, probably, very fine, others but indifferent.

So that as by seed all the immense variety of tulips, hyacinths, ranunculuses, anemones, and several other bulbous and tuberous rooted flowers being originally obtained, the curious florists continue sowing a little seed annually, especially of such kinds as are noted for affording variety.

Though as some sorts are several years before their seedlings flower, none less than three or four years before they attain that state, and some six or seven, as in tulip and hyacinths; the tulip particularly is not only sometimes that time before they blow, and which being at first only of one colour, it is often two or three years more before they break into variegations of stripes and bright colours, renders the work of raising such bulbous
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and tuberous-rooted flowers from seed, appear tedious; but there is no other way of gaining new varieties, and by which a vast diversity of new beauties is to be obtained.

When, therefore, it is designed to propagate bulbous and tuberous-rooted flower plants from seed, you should procure seeds of such as produce the most capital flowers, and which may be sowed either in August, September, or not till March, in beds of light earth, either on the surface, and covered in a quarter, half, or inch deep, according to the size of the seed; or in shallow drills of that depth; or for small quantities, may sow in boxes, or large wide garden pots of light fine mold, and covered in with sifted earth.

Then, as to the future culture, they will come up in April and May; when give light waterings in dry weather, and clear out weeds with the utmost attention, for the plants rise exceedingly slender at first: and as in June the tops or blades of the seedlings will decay, then clean the surface of the earth from weeds and litter, and sift a quarter of an inch of fine mold over: next spring the plants will come up stronger, repeating the same care as the first year; and in the second or third summer, at the decay of the leaves, if they have made any tolerable advance in the bulbing, &c. in the root, take up the young bulbs, &c. and plant them

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in nursery beds in drills an inch deep, and four inches asunder; and having a year's growth here, transplant them into other beds, in drills six inches distance, to remain to attain a flowering state; when mark those flowers which discover proper merit, to be selected from the others at the proper lifting season, when the flowers and leaves fade, in order for their being planted by themselves in beds or borders, either then or in autumn, about October or November.

They will improve in their flowering, and afford an annual encrease of root off-sets for propagating the different varieties permanent in their respective properties. See *propagation by off-sets*.

II. *The PROPAGATION by SUCKERS, in all the different methods.*

The propagation by suckers, consists both of young shoots arising from the roots of many sorts of trees and plants, having tops above ground, and roots below, forming at once each a proper young plant; is a most expeditious, profitable, and effectual mode of raising fresh supplies of numerous sorts both of the tree and shrub tribe, many of the herbaceous perennials, and numerous sorts of succulent plants. And by suckers also of the stem and head, &c. not furnished with roots, till after being detached

ed and planted, many sorts of plants and trees are likewise occasionally propagated; but considerably the most abundant by root-suckers, as well as proving the most expedient and successful for general practice, there being a vast number of trees, shrubs, and plants, that afford that means of propagation very plenteously, by sending up many sucker shoots every year from the bottom, which may with facility be detached therefrom with root fibres, or some rooty part forming, so as they will readily grow when planted, and sometimes form at once as good plants as can be raised in one, two, or three years, from seed, and some other methods of propagation.

Though in many sorts of plants productive of suckers, which do not issue directly from the root of them, but either from the crown thereof a little above ground, or from the sides and bottom of the stem or stock of the vegetable near the earth; also sometimes from the head of the plant, as in some particular succulent kinds; likewise in some sorts, suckers arise from the fruit, as in pine-apple: and all of which, although not furnished with roots, yet the bottom part being formed of a rooty texture, is very free in emitting root fibres in the earth when planted; and grow very successfully, some sorts in the natural ground, others requiring aid of artificial heat of an hot-bed, &c.

So that the propagation by suckers demands

mands particular attention, both for the hardy plants and trees, and many of the green-house and stove exotics, either in default of seed, &c. or where an expeditious increase is required, especially of such plants and trees as furnish them in plenty; as in many sorts of trees and shrubs particularly, which afford great abundance annually, arising to a proper size, mostly in one summer's growth, to detach from the parent root to plant out for propagating or multiplying the species or variety; as the suckers are to be considered as off-spring young plants, similar in all respects to the mother plant or tree that produced them, not varying to different varieties, as in seedling plants; which renders it also a certain method of propagation, to continue any particular desirable variety permanent in its respective property; as sucker-raised plants will affect exactly the same mode of growth in shooting, foliage, flowers and fruit, as the parent, without the least variation, the same as obtain by cuttings, layers, grafting, &c. by which also plants, trees, and flowers, are continued the same in all their properties.

But of suckers from the root in particular, it may be observed in the growth of a very considerable family of the hardy tree and shrub kinds, that they propagate plentifully thereby, both of the forest and ornamental tree and shrub kinds; and several sorts of fruit trees, as fig, filbert, gooseberry, currant,

rant, raspberry, quince, codlin, plums, pears, &c.

And it may be remarked in general, that all trees growing upon their own roots, being raised either from seed, suckers, layers, &c. not having been engrafted upon any stock of a different species or variety, so as the root is one sort, and the top another, but are wholly the same in root, stem, and top, the suckers will form plants similar in all respects to the parent tree, &c. But in trees that are grafted with other sorts, such as nonpareil upon a codlin stock, or a peach upon a plum, the suckers will partake only of the properties or nature of the stock, none of the top or head formed by the graft or bud, but prove either all of the codlin kind, none of the nonpareil grafted thereon, and which form the head of the tree; or, in the other case, will prove all plums, not inheriting any property of the peach budded on the plum stock: and this holds good in all sorts of trees and shrubs, both hardy and tender kinds.

By these hints, every one will readily judge how far the utility of the propagation by suckers, of the tree kinds, that either grow upon their own roots, or are engrafted with different species or varieties is eligible, so as to obtain the sucker-raised plants of the same kind you intend, not expecting to have the suckers that are produced from the root of

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such stocks as are grafted or budded with other kinds, to prove the same kind as the upper part of the tree, formed from the grafting or budding upon the said stock, as occur in most of our cultivated fruit trees; though several sorts also grow mostly upon their own roots, without being grafted or budded, and are commonly propagated by suckers, such as fig, gooseberry, and currant; also mostly the filbert and hazel-nut kinds; and also a numerous train of forest and ornamental trees and shrubs, that produce suckers for propagation.

By suckers also of many sorts of trees, is raised the supply of stocks, on which to bud or graft the choice or desirable varieties and species of trees, of the same genus or class (see *Grafting and Budding*;) and in which case the suckers for this purpose may be gathered promiscuously from trees, either grafted or budded with other sorts, or not, such as suckers of codlins, plums, pears, quinces, and roses, and of any other sorts that are used for stocks.

As suckers are of different sorts in different tribes of plants, we will consider them under the three following heads,

Root suckers.

Stem or stock suckers.

Crown or top suckers.

By

1. *By Root Suckers.*

Root suckers being such young shoots that issue directly from the root of any sort of vegetable, and being themselves also generally furnished with roots, may readily be detached therewith, so as to form immediately good-rooted young plants, and thereby numerous sorts both of very valuable tree and shrub kinds, herbaceous and succulent perennials, are most expeditiously propagated; often proving the most expeditious, and in some sorts the only principal and certain method of propagation; not affording any other eligible progeny in this country, than an annual off-spring of root suckers.

In the tree and shrub kinds, both of forest and ornamental trees and shrubs, and fruit trees, as well as of the woody tribe of the green-house and stove, very many afford a production of root suckers annually, rising in spring and summer; mostly of expeditious growth in their first eruption from the parent plant, obtaining in one season from four, five, or six inches, to two or three feet length, or more, according to the nature of growth of the different trees, &c. and generally when of one summer's shoot, are proper to detach for planting in autumn or spring following: however, it is adviseable to plant them off while not more than one

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or two years old, before the root part becomes thick, hard, and naked of fibres; though some suckers, if without fibres, the bottom part being within the earth, it being formed of a rooty nature, and adapted for rooting, they, when taken off while young, and properly planted, will often emit fibres in that part abundantly well.

The proper season for taking up the tree and shrub suckers for planting, is either in the autumn or spring; or almost any time from the fall of the leaf in October or November, till March, in open weather, for all hardy kinds in the open ground; and for the tender exotics, the green-house and stove, the spring and early part of summer and autumn, is the most proper season for taking off their suckers.

In proceeding to take up the suckers, open the ground a little about the root, so as to admit of digging them up, or slipping them off with as much root part as possible; when taken up, prune off any long naked sticky part at bottom, all lateral or side shoots from the stem; and if any have long, straggling, or weak bending tops, let them be also pruned to order, as it shall seem proper; but those with firm, robust heads, may remain entire: then plant the hardy kinds in the nursery in rows, a foot or two asunder, according to the sorts, size, and order of growth; where permit them to remain to obtain

obtain proper size for the purposes intended; or some sorts of large suckers may be planted at once, where they are finally to remain. And as to the suckers of tender plants, they must be planted in pots of light earth, and placed with the other plants of the same temperature; or any suckers of particular hardy shrubs, may also be planted in pots.

The planting the hardy sorts of tree and shrub in the nursery, may be performed either by dibbling the smaller kinds in, of such as have small roots, or for larger plants, cut out a narrow trench with a spade, straight along by the line, six or eight inches deep, place the plants in the trench, close up to the line side, a foot asunder, with the root three or four inches below the surface, turn the earth in upon them, and when a row is planted, tread the earth evenly to the roots, and fix them with the tops all upright. Or small-rooted suckers may be planted, by making a slit with the spade for each plant, the distance as above, and tread the earth to the roots.

And for the planting of any suckers of tender or more curious plants in pots, let the pots be filled with earth, open an aperture in the middle, insert the sucker, and fill up with earth, and press it gently about the root.

If the planting the suckers is performed in dry weather in spring, &c. and the soil also light and dry, a moderate watering, to
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the choice kinds in particular, will be of much advantage in settling the earth about the roots; however, never fail giving those in pots a proper watering.

Their farther care is to keep them clean from weeds; and in the hardy kinds in the nursery, dig the ground between them every winter or spring, till of proper size for final transplantation.

Many of the frutescent, or small under-shrubby plants, are also productive of root-suckers; such as sage, thyme, savory, hyssop, southernwood, and various others of that low shrubby tribe; in which they often furnish many off-set rooted suckers, either quite from the root, or so near the bottom as to form roots in the ground; and which may be taken off in spring and summer, by slipping them clean off within the earth with roots thereto, and plant them where required for the uses intended.

In the herbaceous perennials, both of some esculent kinds of the kitchen garden, and many of the flowering and medical tribe, they afford root-suckers, or off-set young plants issuing from the root in spring and summer; rising either clean from the sides or crown of the root, or else around the outside of the mother plants, rearing their top above ground, and furnished with roots below; attaining proper growth the same season for detaching for propagation, some in
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the spring, others in summer and autumn. Among the kitchen plants, the artichoke in particular, the suckers springing from the root in spring, are fit to take off for planting soon after, in March and April, and will produce artichokes the same year: also several other perennial esculents, as mint, baulm, tarragon, &c. send up many off-set root-suckers in spring, fit to detach for propagation the same season; and in some of the flowery tribe, as in auricula, &c. the suckers will be fit to plant off in the early part of summer, and will blow in perfection next spring; and so of many other herbaceous plants that are productive of suckers, as above described.

N. B. Herbaceous plants are such as are of an herb-like nature, or whose stems are neither woody nor durable longer than one summer; not abiding like those of tree and shrub kinds, but mostly die down to the ground every year in autumn, and succeeded by new ones in the spring.

They being of various different growths, some sorts produce the suckers fit to take off in spring, others not till summer or autumn, mostly proper to slip the same year they are produced, when from one, two, or three inches to half a foot high, according to the size and nature of growth of the respective plants; others not till the second year, when made but small progress the first summer, and are too minute, or weakly and tender

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for planting off from the parent vegetable; though, in the greater part, they, if planted off early in their growth the same year, will prove the most successful.

In taking off these kind of suckers, you will observe where the bottom part is low in the earth, open the ground a little, if it shall seem necessary, to admit of slipping them clean off to the bottom, or low enough to detach them with some roots where practicable; observing, they may either be slipped off with the thumb, or in larger kinds, or such as adhere firmly to the main root, may occasionally use a knife to assist in taking them off, or sometimes a spade in strong plants; being careful, in either method, to take them off with as good root part as possible; and, if when taken up, there are any hard woody parts of the old root adhering to the bottom, cut it off, together with any long, straggling fibres, broken, decayed, or loose outer leaves: and if any have long straggling tops, trim them a little, as it may seem proper, and then plant them for the purposes intended.

Let them be planted by dibble, either some of the larger sorts at once where they are to remain, either in the full ground or in pots, according to what they are; and the small kinds in nursery-beds, or borders, for a year, in rows from three or four, to five or six inches asunder; or others in pots of such as are usually potted; giving water at plant-

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ing, and occasionally till they have struck
good root, and grow away.

Thus each root-sucker of most of this
tribe of plants, will most readily take root
in a short time, and soon attain good per-
fection; many of them the same year, if
planted in the spring.

But in planting suckers of any of the ten-
der herbaceous plants of the green-house or
stove, let them always have pots, in order
for moving them among the plants of those
departments, or in hot-beds, to forward their
growth: allow them either but small pots at
first, in which to plant them singly; or larger
pots to plant several in each, by way of a
nursery, till they have obtained more strength,
and then transplanted in separate pots; ob-
serving, if, when planted, there is the conve-
nience of a bark-bed, it will be of advan-
tage to plunge the pots of the more tender
and curious kinds therein, which will pro-
mote their expeditious rooting, and soon
after set them a-growing.

The propagation by root-suckers of suc-
culent plants, or such as have thick, fleshy
leaves and stalks, soft and full of moisture,
as in all the aloe tribe, and numerous others,
may, in most sorts, be effected more or less
every year; as they produce them in tolerable
plenty every spring and summer, fit to take
off the same year in autumn, or the follow-
ing spring or summer; when of size, from
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about two or three, to five, six, or eight inches long, according to the nature of growth of the different sorts of mother plants which produce them, they being of various sizes, from two or three inches, to ten or twelve feet high, and produce suckers proportionably in regard to size.

Of this tribe, there are many both hardy and tender kinds, that propagate by suckers, such as, of the hardy sorts, the common house-leek, cobweb and globular headed house-leek, cotyledon or navel-wort, pyramidal or cotyledon saxifrage, hardy calceolarias, orpines, sedums, and several others; but considerably more of the tender kinds of the green-house and hot-house collection, such as American and African aloes, ficoides's, Indian figs, cereuses, euphorbiums, foreign colt's-foot, fig-marigold, sempervivums, pine-apple, and many other sorts which afford root-suckers for propagation; though, in several of the succulent tribe, it may be observed, that they also, as well as root-suckers forming, at once, proper rooted plants, produce off-set suckers above ground, not furnished with roots, and will nevertheless form proper plants, when planted, take good root and grow freely, as prevails in the pine-apple, which afford suckers at top of the stalk from the base of the fruit, and in other plants from the sides of the head, or stem. See *the propagation by Suckers of the stem and head.*

In taking off the suckers of succulent plants, let them be slipped off with the hand clean to the bottom, with as much root part as possible; trim off any broken outer leaves, and cut smooth any ragged parts at bottom, ready for planting. Then observe, of the tender succulent sorts particularly, that if such suckers which adhered close to the body of the old plant, are fleshy, and were slipped off without hardly any root, appear of a very succulent nature, abounding in humidity, and discharging much sucus or sap at the bottom part which joined to the parent vegetable, it is advisable, previous to planting, to lay them upon a shelf, in any dry place, in the green-house or stove, &c. out of the sun, to remain a few days, or a week, according to their succulency, that the moist part at bottom may be a little dried, and moderately hardened, so as to prevent its rotting in the earth when planted; for, if much humidity issues at the bottom, it is apt to rot the plant in that part, without its emitting any roots: however, this precaution is only necessary in some of the most succulent tender kinds of the green-house and stove collection, in which the bottom of the suckers are fleshy, and abounding with moisture, and have but little or no root, as above suggested.

Then having taken off the suckers, and prepared them for planting, generally observe,

in such sorts as are very succulent, to allow them a dry light sandy, or any dry rubbishy soil, or a compost of sandy earth, and dry sifted rubbishy or gravelly substances, as a too rich or moist earth, would be apt to occasion the tender fleshy sorts to rot in winter; though a dry soil is proper, both for the hardy and tender succulents, whether in beds or borders, in the full ground, or in pots; though for the pine-apples, allow a light rich garden mould; and thus proceed to plant them according to the nature of the different sorts, some in the full ground of them that are hardy, others in pots, or under glasses, &c. as below.

The hardy sorts may be planted, the larger suckers at once where they are to remain, in the borders or beds, &c. or the smaller ones in nursery-beds, to acquire more strength for planting out finally; or some in pots, especially any particular, curious, or scarce sort, or any of very diminutive growth. And of the common house-leek kinds, may plant the suckers at once on the top of any shed, pent-house, or low-roofed building, having a little moist soil in a lump, planting the sucker therein, and place it upon the tiles, &c. of the roof of the building, or on the top of a wall, it will grow and multiply exceedingly. Some other sorts of succulent suckers also, as stone-crop and wall-pepper, &c. may be planted in the crevices of walls, buildings, rocks, ruins, &c. to remain to spread about in a natural order.

And as to the suckers of the tender green-house and stove succulents, they must generally all be planted in pots; or some of the hardier green-house sorts, under frames and glasses, to be afterwards potted off separately, when a little more advanced in growth: but let the stove-kind be potted, either separately, or if very small suckers, several in each pot, till stronger, then planted singly in small pots; remarking, if the more tender or curious sorts, of the stove kinds particularly, are plunged in their pots into a bark hot-bed in the stove, &c. especially such as are not already rooted, it will greatly forward them. Also, any of the choicer of the green-house exotics may be thus forwarded, though they will also succeed without that assistance.

By Suckers of the Stem and Branches.

In some plants, both of the tree, shrub, and herbaceous perennials, a sort of sucker-like shoots sometimes issue from the joints of the stem, either near the ground, or at some distance upward; and which, although they are not furnished with roots, the bottom part being generally formed for rooting, and being slipped off and planted, will emit roots and grow; such as often occur in the codlin apple-tree, and some other knotty, soft-wooded, free-shooting kinds, both of trees and shrubs; which from the
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knotty joints of old stems and branches, often send out a multitude of small sucker-shoots in a cluster, in summer, fit to slip off for planting in the autumn, winter, or spring following; as when planted off while young, before they become much hardened at bottom, they will root in due proportion, and form proper plants. The same also obtains in some of the herbaceous plants, and particularly in many of those of the stalky succulent tribe, the suckers issuing from the stem, &c. either in slender shoots or small heads, according to their nature of growth.

In all the above, the suckers here described may be detached for planting in the autumn or spring after they are produced, or the succulents also occasionally in summer, slipping them off close to whence they arise: trim away any broken parts at bottom, side-shoots, &c. as observed in the several sorts of root-suckers; and plant them for the purposes intended according to their respective temperatures and nature of growth, and particular uses, either in the natural ground, in pots or hot-beds, or the green-house and stove, &c. agreeable to the directions before intimated in the propagation by suckers of the root.

Though it may be necessary to observe, that as these kind of suckers being devoid of root, it may be advisable to plant them to have occasional shade from the sun; by planting the hardy kinds in a somewhat shady border,

border, especially in spring-planting, to have shade from the hot sun in summer, to promote their rooting more effectually : or any small quantity may be planted in any bed or border, to have occasional shade of garden mats in hot sunny weather, till they have taken good root ; and those in pots may also be either removed to the shade occasionally, or shaded with mats as above, or any thing convenient ; observing the same also of the green-house and stove plants.

By Suckers of the Head.

In some of the succulent plants particularly, they emit a sort of top-suckers, or young plants without roots, either from the head or stock of the plant near the earth, according to their order of growth, as sometimes happens in sedum, auricula, house-leek, aloë, &c. or at the head of the stem, as in pine-apple, which often afford many suckers at the base of the fruit, close to the head of the main stem, and also on the crown of the fruit ; likewise several other stalky succulents, with elevated heads, furnish a sort of suckers above, proper to detach for propagation, all of which being produced in summer, will be fit to plant off in autumn, about August or September ; but which in the pine-apple should be taken off when the fruit is ripe. And as all these kinds of top-suckers, being produced entirely above ground, at probably from one inch or less, to two or three feet distance therefrom, are consequently
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wholly without roots; though being of a somewhat rooty substance at the base, they, when planted, soon emit fibres and grow.

But some sorts require the assistance of hot-beds to strike them, as in most of the tender exotic tribe, others of the more hardy kinds will readily strike root in the natural ground; though for those of the green-house and stove, artificial heat, either of a common horse-dung hot-bed, or a bark-bed, is of very particular advantage in striking them quickly; and, indeed, the unrooted suckers of the hot-house or stove plants, will not root in near so good perfection, without such aid: even notwithstanding the pots containing them are placed in that department, that unless plunged in the bark-bed, they will not make near so good progress in rooting; for by being plunged in a hot-bed, it diffuses such a peculiar moist warmth to the earth in the pots about the rooting part of the plants, as greatly to promote and forward their imparting root fibres, and set them a-growing above; but a bark-bed, in particular, is considerably the most desirable in its effect for this purpose.

In the pine-apple, the top, or above-ground suckers, devoid of roots, are produced both near the bottom part of the old plant, from between the radical leaves, and at top of the stem, immediately from about the base and at the crown of the fruit; and all of which, when planted, will root freely, but require the aid of

a hot-bed. These sort of suckers are generally of proper growth to take off when the fruit is ripe, in summer and autumn, &c. Slip them off with the hand clean to the place whence they originate; lay them upon a dry shelf a few days or a week, to dry and harden a little the moist part at bottom, being necessary in most of the tender succulent kinds, to prevent their rotting after planting, by any redundant moisture issuing at the part which joined to the mother plant; then strip off any withered, broken, or loose outer leaves, and plant the suckers singly in small pots of light rich soil, give a small portion of water, and plunge them into a bark hot-bed in the hot-house, or any of its appendages, as bark-pits, succession-houses, &c. or in default of a bark-bed, plunge them in a horse-dung hot-bed, under frames and glasses; the suckers will soon strike root, giving occasional moderate waterings, together with the common culture of other stove plants, they will form handsome plants in one year, and in two years will produce pine-apples.

Other tender succulent unrooted top-suckers may be treated as above, especially all the stove kinds; or occasionally any of the choicer sorts belonging to the greenhouse tribe, where there is the convenience of hot-beds: but in defect of this, many sorts when planted in summer, and occasionally shaded from the mid-day sun, will

root tolerably well in natural earth without heat, though, probably, not so soon, so as to advance so forward in growth the same season.

And as to the hardy kinds growing in the open ground, affording top-suckers, plant them in a shady border, giving waterings, and they will root and grow.

Propagation by Layers by the various methods.

The propagation by layers is a capital method by which to raise many sorts of trees and shrubs, both of the hardy kinds, growing in the open ground, and of the tender exotics belonging to the green-house and hot-house collection; effected by laying down the growing lower young shoots and branches of a year or two old into the earth, while they remain growing on their respective mother plants, the body of the layer being inserted in the ground a few inches deep, with the tops out of the earth, only a few inches above the surface; they, although entirely without any root part when layed, will emit roots below, and shoots at top, forming proper rooted plants, mostly in one summer, fit to separate from the parent tree, &c. in autumn or spring after, for planting out in the nursery; and the tender sorts in pots,

pots, to train for their several respective purposes.

Tho' some particular hard-wooded kinds will probably require two years in the lay-bed, before they are properly rooted, which may be known by examining the parts layed in the earth, at the end of the first summer after laying, when those not furnished with roots, must be permitted to remain a year longer, as hereafter more fully explained. However, sometimes in laying the hard-wooded kinds, as in several of the ever-green tribe, if the young tender shoots of the year are layed early in summer, they will root in tolerable perfection the same season for planting off in autumn.

But by layers you may also propagate several sorts of capital herbaceous flowering perennials, chiefly by laying the growing young shoots of the year in summer, in June and July, as they remain attached to the mother plant, root freely the same season, fit to plant off in six weeks, or two months, and will flower next year; such as in all the fine varieties of carnations, double-clove carnations, double pinks, and double sweet-williams; and is the principal mode of propagation by which to multiply the desirable varieties, so as to have them continued always the same, by retaining all the properties of the parent, in regard to the colour, variegations, and doubleness of the flower of each

each respective variety; which never can be acquired in seedling plants, as they vary exceedingly by that method to many different inferior sorts, and the greater part single flowers: and therefore the propagation by seed of these kinds, is only proper when intended to try for new varieties, or when considerable supplies of all sorts indifferently are wanted; and when improved varieties are obtained, they are always encreased principally by layers, or sometimes by pipings, particularly pinks. See *propagation by Pipings*.

It is also observable in such species of the tree and shrub kinds as are prolific in varieties, that the propagation of such varieties by layers, is a most certain method by which they can, at the same time, be both multiplied and continued distinct in their respective peculiarities, either in respect to their mode of growth, foliage, flowers, and fruit, &c.

For this mode of propagation in the tree and shrub kind, is not only productive of the same effect as grafting, budding, cuttings, &c. in continuing the properties as above, of the parent species or variety, without varying, as in seedling plants; but is also expeditious, effectual, and plenteous, as sometimes one single tree or shrub affords numerous layers, which being layed in autumn or spring, form good rooted plants, fit to plant off from the mother tree, &c. in
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the following autumn; and by which many valuable kinds, both of forest trees, ornamental trees, and flowering shrubs in different species and varieties, and both of the deciduous and ever-green tribe, are with great facility propagated in the utmost perfection, and in very many sorts is the most common and expedient mode of propagation. Also for some kinds of eminent fruit trees, as figs, grapevines, and mulberries, which three species, in all their varieties, are very commonly raised by layers: likewise sometimes filberts of some improved or desirable variety, when not furnished with suckers: also sometimes codlins, quinces, gooseberries, and currants; which, however, in the four latter, although they grow most freely by layers, are not often raised by that method, but more generally by suckers, and some by cuttings, as most of them may be propagated by all these ways.

With regard to the method of performing the operation of laying, it, as before hinted, being effected by bowing down the lower and more pliant shoots and smaller branches archways to the earth, and layed, the body of them therein, with the top some inches out, they still remaining growing on the mother plant: but as in many sorts of plants the layers will succeed by simply laying them into the earth, without any preparation of the layer; others requiring an operation of pre-

preparing the layer previous to laying, in order to facilitate the rooting more effectually; and which being performed different ways, as the case requires, such as gashing or flitting the layer, twisting, pricking, wiring, &c. each is explained separately; and in each method, the earth about the bottom of the tree or plant of which you are to make the layers, must be digged or loosened, and then making excavations or openings therein, from one, two or three, to five or six inches deep, for the reception of the layers, going deepest for those of the largest size, they are then to be layed with the body thereof along in the bottom of the cavity, and fastened down each with a hooked stick, raising the top upright, two, three, or several inches out of the ground, according to the substance and length of the layer, so covering in the body of the layer with earth the depth as above. See the different methods following.

Laying the tree kinds.

However, as in the tree and shrub kinds, the preparation of the layers, to promote their rooting more effectually and sooner, is effected different ways, it is proper to explain each method.

It therefore must be remarked, that although in many kinds of the softer wooded trees and shrubs, the layers succeed by common laying, without any other preparation than

than just laying the shoots or branches into the earth, and they will put out roots abundantly well, yet in many of the hard-wooded tribe, the layers will not root freely, unless they are previously slit or gashed with a knife on the under side, in the part that is to be layed in the earth, as they will more readily emit fibres from the gash, than if quite intire, and which is, indeed, a very eligible operation in all sorts of layers, to render them more successful and expeditious in rooting: others will succeed by giving the layer a gentle twist in the part which is to be layed: some again that root reluctantly, or slow, require to have the layer notched or chipped, by cutting out small chips of the bark and wood, or bound round tight with a piece of wire, or pierced through with an awl, in the layed part, to encourage the emission of fibres more free and abundant; but particularly in the difficult-rooting kinds, and which cannot be easily increased by any other method of propagation, than by layers. See each method explained as below.

By simple or common laying, or laying the shoot intire, without either slitting, twisting, or any other preparation of the layer than just inserting it a proper depth into the earth, many of the softer wood shrubs and trees will very readily send out roots plenteously, as in poplar, alder, plane-tree, sycamore, fig, vine, currant, and various
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other forts; though notwithstanding this, it may prove more certainly successful, by giving the layer a small slit or gash underneath, as in slit-laying, described below.

By slit-laying, i. e. by slitting or gashing the layer at a joint, will prove successful in such as do not succeed by common laying, and may be practised to much advantage in the operation of laying in general; and is effected by cutting a small slit or gash upward, with a sharp knife, on the under-side of the layer, at a joint in the part which is to be layed in the earth, making the gash slantingly upward, about a third, or near half way through the shoot, slitting it about an inch or two up the middle; then is to be layed in the earth, keeping the gash open by raising the top upright; and in that manner secure it in its place, and earth it over the proper depth, they will emit root fibres abundantly about the bottom and sides of the gash. So that this method may be adopted for general laying, as the most successful in the greater part, except for any of the hard-wooded difficult rooting kinds, in which, probably, notching or wiring, &c. will be more eligible.

By twisting the layer, is sometimes practised instead of slitting, in laying small shoots of a pliable toughish nature, that by giving them a gentle twist just in the part which is to be layed in the earth, they are
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apt to strike root more readily at the bruised part, than if layed intire, and is easily and expeditiously performed.

By notching or chipping out small chips of the layer, is sometimes practised to largish layers, and in such hard-wooded kinds that are difficult in rooting by any of the preceding methods; and is performed by chipping or cutting out with a knife, some small chips of the bark and wood together, round about a joint in the part to be layed, which will often promote the emission of fibres in the chipped parts, when the other former methods of laying prove unsuccessful.

By wiring the layer, or twisting wire round the part to be layed, is with design to confine the sap, so as to force out fibres at the part wired around; and is eligible to be practised occasionally in laying the hard-wooded difficult rooting kinds, that root reluctantly, by any of the foregoing ways of laying; and is effected by twisting a piece of small wire tightly round the layer, at a joint or bud in the part proper to be layed in the earth. Afterwards lay it by the general method of laying, as below explained.

By pricking or piercing the layer with an awl at a joint, often proves effectual in laying such hard-wooded or reluctant-rooting kinds, that will not succeed either by common laying, or slit laying, &c. and is sometimes practised instead of chipping or wiring

ing the layer, as it generally produces the same effect, in promoting the emission of roots in the wounded parts; and is performed by pricking or piercing the layer with an awl round about a joint, quite through, in the part that is to be layed; and then is to be layed in the earth as directed below for general laying.

Having thus far explained the different methods of preparing the layers, it is necessary to observe, that as there are many sorts which will root free enough without either flitting, twisting, notching, &c. yet in the greater part of such of the tree and shrub kinds, as are usually propagated by layers, the slit-laying is very eligible for general practice. The other methods may be practised occasionally, as it may be thought expedient, agreeable to the hints exhibited in explaining the several methods as above.

Then observing, as to the proper parts of trees and shrubs for layers, it must be principally the young shoots of a year old, or of one summer's growth, or never more than two or three years old; but those of only one or two years are considerably preferable for rooting freely.

Generally either choosing the shoots that are situated near the ground, or such branches as are furnished with young shoots, and that can be bent down low enough for readily laying
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ing the shoots thereof into the earth; such of the shrub kinds as generally branch out low, naturally furnish a supply of shoots conveniently situated for laying; but those rising with tall stems, elevating all the branches at a distance from the ground, require to have the stems of some cut down, while young, to form stools to produce shoots low enough for layers; and for this purpose the stems should be cut down when only two or three inches thick, performing it in autumn or spring, by cutting them off near the ground; they will produce many bottom shoots the following summer for laying in the first or second autumn after; and when the layers are rooted and planted off, the same stools remaining, furnish an annual supply for laying every year: or for any curious or scarce trees, whose branches are situated at a distance from the ground, you may place large pots, or boxes, or tubs, filled with earth, upon a stage raised high enough to receive the layers.

Sometimes in laying trees and shrubs, not furnished with branches low enough to reach the earth properly for laying, it is effected by throwing down the tree, &c. on one side to the ground, by loosening the roots on the contrary side, and securing it in that position, lay all the proper shoots and branches that are conveniently situated for that operation; and next autumn or spring,
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when the layers are properly rooted and planted off, the mother tree may be elevated again in its upright direction, if required, or remain for a stool to furnish more layers.

Then, as to the operation of laying the shoots and branches in the earth, nearly one general method may be successfully practised, as in the following directions.

First, provide a quantity of hooked or forked sticks, of different sizes and strength, wherewith to peg the branches, &c. securely down into the ground at the time of laying them, and to fix them in that position till they are well rooted.

These being ready, let the ground about the tree or shrub, intended for laying, be digged, and the earth broken fine for the reception of the layers; or if in pots, let the earth therein be loosened a little depth at top; or if small pots that will not admit of laying in the same pot, have others filled with earth, placed near enough to receive the layers; then, in each method, let the proper shoots or branches, as they remain on the tree, &c. be bent down, and opening the earth in an oblongish cavity outward, for each layer, about three, four, or five inches deep, and introduce the body of the layer along the bottom bendingly with the top, two or three inches, or more, above-ground, fastening each down with a hooked stick, or peg, thrust into the ground, especially

cially to all those that have a strong elastic spring: and as in many sorts of shrubs, not furnishing shoots below, but that the main branches affording a proper supply thereof, must be drawn down and well secured, by fastening them firmly into the earth with strong hooked sticks, and then all the young shoots on each branch are to be regularly layed, and fastened down in the aforesaid manner; observing in general, as you proceed in laying, to raise the top of each layer uprightly out of the ground, and so as those which are slit-layed, have the slit or gash at bottom continued open; and directly cover in the body of the layers with the earth three, four, or five inches deep, the top of each layer being from about two or three, to four, five, or six inches out of the earth, according to their length; or those having long or weak, straggling or crooked tops, may be pruned down to one, two, or three buds; carefully levelling the surface of the earth evenly between, and close about the stems of all the layers in a regular manner. And if very dry weather in autumn or spring-laying, may give a moderate watering to settle and moisten the earth.

In laying any of the more tender or curious kinds of trees and shrubs that are in pots, that do not root freely, you may lay the layers thereof in other pots, plunged into a bark bed; the heat thereof will greatly

greatly facilitate their emitting roots in a short time.

The proper culture of tree and shrub layers in general, after laying, is, principally keeping the ground about them clean from weeds, and in dry light soils, it will be proper, in very drying weather, in spring and summer, to give some occasional watering, which will be of much advantage, especially in the advanced part of the spring, when the drying winds have penetrated the earth, and in the early part of summer, that by keeping the soil always moderately moist, it will greatly encourage and forward the layers in rooting sooner and more effectually.

In one year after laying, or generally in the autumn following, the layers will mostly be properly rooted, fit for planting off in October or November; but, as probably, there may be some sorts that will not root effectually in less than two years, we must give proper attention to the layers in general, in the autumn or spring, in examining the progress they have made in rooting; and if any appear not properly rooted, permit them to remain another year; but as the greater part will be well rooted the first year, let them be planted off either in autumn, about October or November, &c. or in the spring following, observing in taking up the rooted layers, to open the earth about them, and with a knife cut them off from the mother

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tree

tree or shrub, clean beyond the rooted part, then prune off any broken or naked parts at bottom, and weak straggling side shoots above, ready for planting.

Then proceed to plant those of the hardy trees and shrubs, in nursery rows, from six inches to one or two feet distance, according to the nature of growth and size of the different sorts of layers; let the ground be previously digged or trenched, and then plant them, the very small kinds by dibble, and the larger sorts either by forming crevices along by the line with the spade, thrust into the earth, introducing a plant directly in each crevice or slit, and tread the earth thereto; or by cutting out, with the spade, narrow trenches, by line, the way of the rows, six or eight inches deep, making the line-side upright; so plant the layers therein, with their roots against the upright side, and turn in the earth upon them, treading it gently to fix their roots, and to steady the tops upright and even in the rows; then observing, in either method of planting, that if early in autumn, or late in spring, some moderate waterings will prove beneficial; keep them clean from weeds all summer, by occasional hoeing, &c. and dig between them in winter; and in a year or two, let such of them as require more room, be planted in wider rows, others transplanted where they are to remain, &c.

Such

Such layers of any choice or tender tree, and shrub kinds, as are intended to be planted in pots, may have at first, those of a small or middling size; fill them half way, or two thirds, with good fresh earth, plant a layer in each, fill up above the roots of it with more earth, and water them; then place them in their proper departments, either in the open ground, or the green-house, or stove, according to their respective temperatures, in being more or less hardy or tender; and when they have encreased in growth, transplant them into larger pots, &c.

Laying herbaceous kinds.

In the herbaceous perennials, only a few sorts are commonly propagated by layers, such particularly as carnations, clove gilliflowers, double sweet-williams, and sometimes curious sorts of pinks, &c. though some other sorts may also be propagated by that method, in such as furnish similar bottom shoots of a proper pliant growth for laying, and that generally abide all the year, as in the sorts above mentioned; for those whose shoots are annual, dying off in winter, are not so eligible; nevertheless may try any desirable species and varieties, where an encrease is required.

However, by layers, all the fine varieties of carnations are always propagated, as the

only successful method by which they can be increased, so as each may retain all the qualities of its respective parent, in regard to the colour, variegation, and doubleness of the flowers, as before observed, for they never come the same again from seed.

In these and other herbaceous kinds, the young shoots of the same year, in summer, are the proper parts for layers, and are generally of a proper growth for laying in June, July, and beginning of August, when four, five, or six inches long, which being then laid, will root in the earth in six weeks, forming proper rooted plants, fit to separate from the parent, for planting out in beds, borders, or pots, for flowering in good perfection next summer, and will then also afford layers for future propagation.

Performing the Operation.

For propagating herbaceous plants, by layers, one general method may be practised; and as all the fine varieties of carnations, particularly, are always propagated by layers; also the large double sweet-williams, &c. We will explain the successful methods of laying these sorts, which may serve as a general direction in occasionally laying any other herbaceous kinds.

To perform the operation, be furnished with a sharp penknife, wherewith to trim and
 slit

fit the layer proper for laying, also a parcel of small hooked sticks, from any slender brush wood, old birch or beech brush, dried branches of fern, &c. with which to peg down the layers in the earth; and a quantity of fresh, light, finely broken mold, in a wheelbarrow or a basket, for occasionally earthing round about such of the old plants, as require the earth to be raised, more or less, to receive the layer more commodiously, and to assist in earthing them over, when layed and pegged down in their proper position; observing as follows.

The shoots of the same year in summer being the proper layers, they will be advanced to a proper growth for laying, towards the middle or latter end of June, and in July and beginning of August, not later, when from about four or five, to six or eight inches long, so as to admit of being readily layed down in the earth, as they remain attached to the mother plants; for the earlier in the season they are layed after they have attained to a proper length, the sooner they will be rooted for planting off the same season to acquire a proper degree of strength before winter.

Proceed to the operation by first clearing away all weeds and rubbish from about the old plant which furnishes the layers, also with the point of a garden trowel, or knife, loosen the earth a little depth around them,

both to those in the full ground and in pots ; and at the same time, if the surface of the earth is rather low, add some fresh mold, to raise it sufficiently for the more ready reception of the layer.

Then selecting the most eligible pliant shoots of the year for laying, strip off the lower leaves, so as to form several inches of clear stalk below to insert in the earth, and cut the long straggling ends of the top leaves evenly off, an inch or two down ; which done, proceed to slit the layer underneath at a point, to promote the emission of root-fibres, more expeditious and abundant, as they will issue freely at the gash or cut part : performing it thus, hold the top of the shoot with one hand, and with your knife, fix on a joint about the middle of the underside of the shoot, there cut a gash or slit half way through in a slanting direction upward, continuing the cut up the middle about half an inch or but little more, it is then to be laid with the gashed part open : observing to form, with the hand, a small vacancy in the earth outward from the mother plant, an inch or two deep to receive the layer, which then lay down in the cavity, with the head or top outward, and raised gently upright, keeping the slit part or gash underneath open, as above observed, and in that position peg down the body of the layer, with one of the small hooked sticks, so as the top of the layer be
only

only one or two inches out of the ground, and directly earth over the layed part, one or two inches deep; still preserving the gash open and the top upright, pressing the earth lightly about them; and thus proceed laying all the proper shoots on each old plant or stool, finishing the surface of the earth evenly between all the layers, and let them be directly watered to settle the earth closely in every part, and to moisten it in a middling degree, to prepare the layer for rooting; observing to repeat the waterings every day or two, in dry weather, for the first two or three weeks, and they will freely take root at the bottom of the tongue of the gash or slit.

Generally in about five or six weeks, the layers will be sufficiently well rooted for separating from the main plants; however when they have been layed from about four or five, to six or seven weeks, examine their progress in rooting, by opening the earth about some of the layers; and as soon as they appear to be tolerably well rooted in the earth, they should be detached from the mother plant, to be planted separately in the nursery-beds to root more effectually, and acquire due strength the same year, before winter, the better to endure the rigours of that season, and to flower in due perfection the following year in their proper season.

In proceeding to take off the layers, when properly rooted as above, let the earth about them be opened and cleared away quite to the rooted parts, then with a knife cut them from the mother plant, clean off beyond the gash at bottom, so as to remove them, with all the roots they have made, raising them carefully out of the earth, with as much of the root fibres as possible; then prune off any naked woody part at bottom, destitute of fibres, but preserve all the roots, only just trim any long straggling fibres a little shorter, and cut off the long ends of the top leaves, they are then ready for planting, which may be performed in any bed or border of good earth, fresh digged and the surface raked smooth; and in which set the layers in nursery rows six inches asunder, planting them either by dibble, or hole them in by opening a small aperture for each plant with a garden trowel; inserting them in either method, with all the shank or stalk part in the ground up to the leaves, closing the earth well about the root and body of each plant; and finish with a proper watering; which must be repeated occasionally till the plants have struck new root and grow; and here to remain to increase in growth till October or March, then transplanted with balls of earth about their roots, to where they are to flower, either in the borders or pots as required. See as hereafter directed.

Or

Or some of the more curious sorts of carnations or other plants, usually potted, may be pricked in small pots, one layer in each, watered as above, and to remain till next October or March, then planted into large pots to continue for flowering, as below.

In Autumn following of the same year, about October and November, the layers planted off, as above, in nursery-beds, &c. will be grown strong plants, when, or in spring ensuing, a quantity of the best may be transplanted where they are finally to remain. Some sorts into the common flower-borders, to stand the full weather all the year, others plant in pots, &c. observing to take them up with a garden trowel, each layer with a good ball of earth adhering about their roots, so as they may scarcely feel any check by their removal, and to be planted with the ball intire, where intended; opening apertures in the earth, sufficient to receive the ball about each layer freely, and insert them therein up to the bottom of the head; filling in the mold closely around, press it gently down: and give proper waterings. Others of the layers planted off from the old plants in nursery beds or small pots, may remain therein, till the spring, about March then transplanted as above, as many as are wanted.

Observe, that any layers of tender herbaceous plants of the green house and stove.

collection, raised as above, must be planted at once in pots finally to remain, for moving into these departments.

But also in the capital carnations or other choice kinds of hardy plants, raised from layers, it is proper in autumn, about October or beginning of November to plant a quantity of the prime layers in pots, to move under occasional shelter in winter, in time of rigorous frosts; for which purpose, you may either plant them in small pots to remain all winter, and transplanted into large pots in the spring, in which to remain to blow, or may be planted at once into large pots finally to remain: observing in either way, to transplant them into the pots with balls of earth to their roots, as above advised, one layer in each pot, or two in a large pot if required, give water as soon as planted, and place the pots in a warm sunny exposure, or close together in a garden frame, in a like situation, to remain for the winter: and in severe frosty or snowy weather defend them by putting on the lights or glasses, or with a covering of garden mats, but must be allowed the free air in all mild or moderate weather, by keeping the glasses or other shelter constantly off. And in March such as have remained all winter in small pots, should be planted into large pots, for remaining to flower; transplanting them with balls, as before directed.

Almost

Almost all the layers of carnations, and other herbaceous kinds, will make good plants the same year of laying, and will flower in full perfection the year following, and at the same time, afford a supply of proper shoots, to lay for further propagation, as already suggested.

Propagation by Cuttings.

By cuttings of the young shoots of the branches, numerous sorts of trees, shrubs and under-shrubby plants are abundantly propagated. Also some sorts of herbaceous and succulent plants; likewise some of these last mentioned kinds also by cuttings of the main stem and flower-stalks; and in all of which, the propagation by cuttings, is both a very plentiful and expeditious method; but particular in numerous tree and shrub kinds, and also of the low under-shrubby tribe, as sage, thyme, hyssop, lavender, &c. as a large quantity of cuttings of the young shoots of a year old, may soon be cut off and planted in the spring or autumn, all of which will generally in one summer, root freely at bottom and push out shoots at top, and form proper rooted plants in one year; and in some sorts, cuttings of the young shoots of the same year in summer, planted in June, will also grow, and make good rooted plants by autumn following.

So that by the propagation by cuttings, as every shoot or twig cut off, may be considered as parts similar to the whole plant, that being planted, they each become a distinct vegetable, the same in every order of growth, leaves, flowers, and fruit, as the parent plant that produced them; and proves not only a certain method of propagation for continuing any desirable varieties, so propagated, invariably the same in every property as the mother plant from which the cuttings were taken, but also is, in many sorts, a very profitable mode of raising a supply of the desired sorts, since every shoot of a tree, &c. may be thus formed into a new plant, as just above observed, and in many sorts will make as good plants in one year, as seedlings will in two or three.

But the propagation by cuttings is more abundantly effected in the tree and shrub tribe, than in the herbaceous kinds, which generally in the perennials, propagate more successfully and abundantly by off-sets of the root, (See *propagation by off-sets, and parting the roots, &c.*) though several sorts that produce robust firm abiding shoots, will also grow by cuttings thereof; however, as to many sorts of trees and shrubs, cuttings is the most eligible method of general propagation, most sorts principally by the young shoots of a year old, and some both by the young wood and large truncheons and poles of several years growth,

growth, as in willow, alder, and some other aquatics.

As therefore the cuttings are of different sorts in different tribes of plants, we will explain each under the following heads, with the method of treating them, for the purpose of propagating their respective kinds, viz.

By cuttings of the young shoots of a year old.

By cuttings of the young shoots of the same year in summer.

By large cuttings of the two or three years old wood, in truncheons and poles, one or two inches thick, and in length, from half a yard, or two or three feet, to two or three yards.

By cuttings of flower stalks.

By cuttings of the main stem.

By cuttings of roots.

Each of these methods of propagation by cuttings, requires a peculiar treatment according to the nature of the trees and plants to which each method is adapted, though for the greater part, the cuttings of a year old are the most successful for general practice, in the tree and shrub kinds; those of the same year for some particular sorts, and for the herbaceous perennials that may be occasionally propagated by cuttings; and the truncheon
and

and pole cuttings are chiefly adapted to aquatic trees, as willow, alder, &c. the cuttings of flower stalks, stems, &c. to some flowering perennials, and succulents; and cuttings of the roots, both to some tree and shrub kinds, and herbaceous plants.—See each method under its proper head.

1. *By cuttings of the young Shoots of a Year old.*

By cuttings of the young shoots of a year old, or one summer's growth, from the spring till October or November, a considerable number of tree and shrub kinds are very expeditiously and plentifully propagated, both of the hardy kinds in the open ground, and tender sorts in the green-house or stove, and the method is as follows:

For the hardy trees and shrubs, in the full ground, may begin the propagation by cuttings in October and November, at the fall of the leaf, in most of the deciduous kinds, and may be continued occasionally, in open weather, all winter; or February and March is a proper time for any of the more delicate sorts; and for evergreens, may begin planting cuttings in September, in a shady border, such as those of laurel, &c. though others that are more tender, will be more successful in the spring, in February, March, and April.

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NURSERY MAN'S COMPANION. III

In both deciduous and evergreen kinds, let the young robust outside shoots of one year's growth, from spring till autumn, be chosen for cuttings, preferring the moderately strong, firm shoots, and cut them off with a sharp knife, in lengths from five or six inches to one foot, or half a yard long, according to their nature of growth and strength; and where convenient, may sometimes cut them off with an inch or two of the former year's wood, adhering to the bottom of each cutting, though the cuttings of most sorts will succeed without this precaution; trim off any bottom leaves, and all side shoots, and if any have very weak or crooked tops, may prune them a little, but those with robust, firm tops, leave intire; though as some kinds of trees and shrubs make very long shoots of many feet in length, in one summer, as in vine, honey-suckle, and passion-flower, &c. these should be divided into two, three, or more cuttings, of two, three, or several joints in length, according to their growth, as in the vine, and other sorts which grow in joints, and long trailing shoots.

Then having thus procured the cuttings, dig a shady border or any space of pliable, rich, moist ground, for planting them in, the hardy free-rooting kinds will succeed any where, either in the shade or the open quarters of ground, though all sorts more successfully in a moderate shade from the following summer's sun;

sun; but the choicest sorts, particularly, should have a somewhat shady place, or in beds where they can have occasional shade of mats from the hot sun in the early part of summer, till they have taken root; otherwise must have considerable waterings in that season.

Plant them by dibble in the places prepared as above, in rows from six inches to a foot asunder, or more if large kinds, inserting each about half way, or two parts of three into the ground, or in such as the vine, plant them down to the uppermost eye, or not leave above one joint out of the earth, observing, in general, to close the earth well about them in planting, both at bottom and the body of the cuttings, filling up all holes made by the dibble; and if dry weather, and in early autumn, or late spring planting, give a good watering, and repeat the waterings in dry weather, frequently, in the spring or early part of summer, otherwise many of the cuttings will fail.

But any cuttings of the choicest kinds of trees and shrubs, or of such as do not root freely, or that you would wish to assist or forward therein as much as possible, they being planted in pots, several in each, may be plunged into any hot-bed, or in the bark bed in a stove, &c. which will forward their rooting exceedingly, and may be practised to
any

any sorts you are desirous of forwarding.

In the frutescent or low under-shrubby tribe, such as southern-wood, shrubby worm-wood, sage, lavender, hyssop, and various others of similar growth, the cuttings of the yearling shoots generally prove very successful in the spring or early part of summer, about March, April, and May, though in the ever-green kinds, as sage, &c. the cuttings will grow in any of the summer months, planted in a shady border, and well watered.

Sometimes cuttings of the yearling shoots as above, of the hardy tree and shrub kinds, may be planted at once where they are finally to remain, such as in vine, may plant some cuttings in borders, under south walls, or where required, to take their chance, planting more than may be just necessary to furnish the place if they all succeed, that there may be the greater chance of success; and of the superabundancy, if any, the worst may be transplanted to another place; cuttings of figs may also sometimes be planted in the same manner, against walls, to remain; likewise currants, &c. in north borders, against walls, and pales, &c.

And in the aquatic tribe, as willow, alder, elder, &c. may also plant large cuttings of the yearling shoots, at once where they are to remain, in moist situations, such as the willow, either in continued plantations, to form

form stools to produce annual crops of twigs and rods for the basket makers, &c. for which purpose cut off a quantity of the large shoots of the last year's growth, in the spring, in lengths of half a yard, and having digged the ground, plant them in rows of four or five feet asunder, and two or three feet distance in the line, inserting them two parts of three into the ground, they will grow freely without further care, keeping them clear of large weeds; or may plant large cuttings of willow, alder, elder, poplar, &c. along the sides of water, to remain either planted into the sides or top of the banks thereof, as convenient, and also along the sides of watery ditches, or in any moist places, where required, either to form hedges expeditiously, or to grow up for poles, or to cut occasionally; likewise may plant cuttings of any osier willow in some low, moist soil, or by the sides of water or ditches, &c. as aforesaid, to remain to produce osier twigs for the occasional use of a garden or nursery ground, or any domestic purposes; and will prove very useful.

Also in the aquatic trees, as willow, alder and elder; long cuttings of the strong one or two year's shoots, in length from three or four, to five or six feet, will also succeed if planted in a moist soil, as is sometimes practised when designed to form a sort of immediate hedge, either as a blind or shelter to any particular place,

place, planting the cuttings, as above, at once where they are to remain, each a foot or more into the ground, and from six or eight to ten or twelve inches asunder, and if planted across one another in the row, chequer-ways, they will render the hedge stronger.

In the green-house, and hot-house plants, many of the tree and shrub tribe are also propagated by cuttings both of the young shoots of a year old, and of the same year's shoots, planting the former generally in the spring, about March, April, or May, and the latter commonly in June or July, when the shoots of the same year are of due size to detach for cuttings, in all of which observe nearly the same method as directed for the cuttings of hardy trees, taking off the shoots for cuttings from about three or four to six or eight inches, or a foot long, or any very long running shoots may be cut into the above lengths; divest them of the lower leaves, prune weak or crooked tops, then dibble them in pots of good earth, several cuttings in each pot, inserted half way, or two thirds into the earth, give water, and place the pots in the shade, in the green-house or stove, or so as they may have occasional shade in the middle of sunny days, till they have taken root; or if planted in summer, the pots of green-house cuttings may be placed in a shady border, or any place in the open air, where they can have occasional

sional shade of mats from the mid-day sun till rooted.

But in planting the cuttings of these tender exotics, of the green-house and stove collections, it will be of particular advantage to plunge the pots in which they are planted in a hot-bed, or in the bark-bed in the stove, which will considerably facilitate and expedite their rooting, being careful to give necessary waterings.

Also by hot-beds, if any sorts of cuttings, hardy or tender, that are known to be reluctant and slow in rooting, or any curious sorts which you would wish to assist and forward in rooting as much as possible, that being planted in pots, and plunged in a hot-bed or bark-bed of the stove, &c. may have the pots covered close down with hand glasses to exclude the external air, which will prove very effectual in promoting a speedy emission of roots, giving proper waterings often to keep the earth always moderately moist.

However, cuttings of several sorts of green-house shoots will root freely in natural earth, without the aid of hot-beds, such as geraniums, and also sometimes myrtle, the young shoots of the year, potted and placed under glasses.

Vast supplies of myrtles are propagated by cuttings, about London, to raise plants for the markets, raised both from the young shoots of a year old, planted in the spring,

spring, and more abundantly from the shoots of the same summer, planted in June and July; and which in the latter particularly, being planted in pots, many in each (as below explained) and covered down close with glasses, and duly watered, they will root tolerably well without assistance of hot-beds.

But by the aid of a hot-bed, such as the bark-bed of the stove, or in default thereof, any other hot-bed under glasses, may propagate the myrtle very abundantly, both by cuttings of the former years shoots in spring, planted in March, April, or May, and by the shoots of the same year in summer, in June, July, and beginning of August, and they will be well rooted the same year.

In either method chuse for cuttings the side shoots produced from the branches of the head, of from three or four to five or six inches long; though when intended to have the cuttings principally of the shoots of the same year, those of three or four inches are the most eligible, observing in general to select the more robust growing shoots, and either cut them off with a knife from the mother branches, or the small ones slip off occasionally with the hand, though cutting them off with a knife is more adviseable for the larger shoots, but the small ones will readily slip off with the finger and thumb; strip off all the under leaves more than half way up the
the

the shoots or cuttings, then proceed to plant them in large pots or wide shallow earthen pans, having holes at bottom, as in common garden pots, to discharge the redundant moisture from the earth, in the occasional waterings, filling the pots or pans with good rich mold, and plant several or many of these small cuttings in each, about one or two inches asunder, and inserted in the earth within an inch of their tops, but in the larger cuttings, allow more room, and their tops two or three or more inches, out of the earth, giving directly a good watering to settle the earth closely about all the cuttings in a regular manner.

Then where there is the convenience either of a bark hot-bed, in a hot-house, or bark-pit, &c. or in defect thereof, a common dung hot-bed, under frames and glassess, plunge the pots of cuttings therein, observing if a bark-bed, to plunge them to the rims in the bark; and if a dung-bed, having six inches of earth thereon, sink the pots in the earth; but a bark-bed is preferable for its moderate, steady, kindly, and durable heat; give them occasional shade from the hot sun, and frequent waterings, they will root freely in a short time the same year, and be fit to plant out separately, into small pots, in autumn or spring following, and make handsome little plants in one year.

By

By the above practice you may make three different plantings in one year, if required to raise large supplies, performing the first in the spring, a second and more considerable planting in June or July, and the third in August or September, assisting each with heat in a hot-bed or bark-bed, &c. especially the spring and autumn plantings, but it will also prove greatly beneficial to all in forwarding their rooting the same year.

But in want of hot-beds, the cuttings of myrtle, &c. may be planted, with some success, in natural earth, unassisted by artificial heat, as before observed, especially of the quite young shoots, in spring and summer, from about March, April, and May, till June or July, in pots of good earth, and either covered down with hand-glasses, or placed in a shallow garden frame, covered with its proper lights, or glass sashes, or oiled paper; giving frequent, moderate waterings, many of them will root the same year, more especially the cuttings of the shoots of the same summer, planted in June or July; though not near so expeditious and effectually, as when assisted by hot-beds, however, for want of such conveniences, the other method as above is worth practising.

Also cuttings of geraniums, both with and without the aid of hot-beds, will succeed; but by the latter, they may be considerably forwarded, planted either in spring
or

or summer, in pots of light rich mold, and plunged either in a bark or dung hot bed, as convenient, they will very quickly root; or without a hot bed, cuttings of these plants may also be planted in spring or summer, in pots as above, and placed under glasses, &c. as advised for the myrtles when raised with heat, &c. they will most of them root, but not so freely and expeditious, as when assisted by a hot bed.

In the herbaceous tribe they do not near so generally afford the opportunity of year old shoots for cuttings, as in the tree and shrub kinds, but mostly shoots of the same year, in June and July; as an herbaceous plant is considered, principally, such whose stems and branches are not more than one summer's duration, dying down to the ground every autumn, however, as there are some sorts denominated herbaceous, whose stem and branches abide two or more years, such as wall-flower, and balm of Gilead, &c. and in which both the year old shoots and those of the same year, may be used for cuttings, in April, May and June; taking off either the side shoots produced from the branches, of such as assume a branching growth above or below, as in wall flower and pinks, &c. or of the main stalks, in such as shoot up in a stalky order, as in the balm of Gilead, or in some sorts, take the cuttings of the flower stalks, as in lychnidea, and scarlet Lychnis, &c. observing

ing in general, in procuring the cuttings, to cut them off in lengths of from three, to six or eight inches, according to their nature of shooting; or the long stalky shoots, may be divided into two, three or more lengths as above; planting them in the shade, or where they may be conveniently shaded from the sun in the middle of the day, or from ten to four or five o'clock; giving proper waterings; or any of the more curious sorts may be planted in pots shaded and watered as above; or to forward any choicer, tenderer kinds, may plunge the pots in a hot bed: or in default thereof, any sorts that do not root freely, may be covered down close with hand glasses, which will greatly expedite their rooting: or this may also be occasionally practised even to such as are also plunged in a hot bed.

Any of the green house, and stove herbageous plants, intended for propagation by cuttings, may have it performed in spring and summer, taking off the cuttings as above, plant them in pots, and plunged in a bark bed, or any common hot bed under glasses, giving occasional water and shade, &c. as above.

For although the cuttings of several of the green house plants will succeed tolerably without artificial heat of hot beds, if the quite young shoots are planted in April, May, June and July, and covered close with hand glasses, shaded from the sun, in

the heat of the day, and frequently watered; yet by the assistance of a hot bed, the whole of the propagation of this class of exotics, by cuttings, may be more certain and expeditiously effected.

And in the hot-house collection, all propagation by cuttings, should be assisted by heat, planting the cuttings in pots and plunge them in the bark-bed.

In the succulent tribe of plants, consisting of soft, fleshy stems, branches, and leaves abounding in humidity, cuttings of the young shoots, or of two or three years old, will in many sorts grow very freely, and is the principal mode of propagation by which a great many of these sorts of plants are propagated, but in the green house and stove collection particularly, very many are raised by cuttings, such as the *Cactus opuntia*, or Indian fig, *Euphorbia*, tree sedum, creeping cereus, fig marigolds, torch-thistle, &c. and also most of the hardy perennial succulents of the open ground.

Most of these kinds of plants propagate readily by cuttings of a year or two old, planted in spring and summer, in April, May, June, July, &c. or also of the shoots of the same year in July and August; and as these plants assume various habits of growth, with soft succulent fleshy stems, branches and leaves, they accordingly afford shoots for cuttings of various structures, shapes and dimensions, some being of long slender growth,

with

with the stalks either trailing low, or climbing ascendingly upon support, as in the creeping cereus tribe, others grow more uprightly, branching out into flat broad-jointed shoots, as in Indian fig. Some shoot out into many irregular branches and shoots, in some sorts round, some triangular, and of various other forms, in different species, as in the fig-marigold; which in some are of diminutive growth, only a few inches high, others are from one or two to several feet, affording many shoots of the branches, &c. proper for cuttings: and some succulents, as in the torch-thistle, rise with only a single stem, erecting itself like a column, many feet high, without either branches or leaves, and can only be propagated by cuttings principally of the top of the main stem, cut off in lengths of six, eight or ten inches, or more, and sometimes by cutting off the top for this purpose, it forces out lateral or side shoots below, proper either to detach as cuttings or slips, the same or next year; all of which succulent kinds, having thick, soft, carnosse or fleshy succulent shoots, soft and humid, very replete with moisture, that when the cuttings are detached for planting, they should generally be permitted to lie in some dry place, a few days, or a week, or fortnight, according to their succulency; to dry and heal over the wound or cut part, at bottom, which adhered to the mother plant, otherwise are apt

to rot in that part when planted, by the great quantity of succus or sap, that would otherwise issue therefrom, but especially in the more tender and very succulent kinds of the green house and stove collection, and of which the cuttings should not be planted without previously observing the above precaution, of laying them for sometime to heal over the wounds made in cutting them from the old plant. For some sorts of succulent plants, are so abundant in moisture, that they will retain their vegetative quality a long time out of the earth, supported by their own succulency, and when afterwards planted will most readily grow.

The shoots for cuttings, may be cut off for planting in spring, summer, and early part of autumn, according as they are of proper growth, cut them off with a sharp knife in lengths proportional to their nature of growth from two or three, to six or eight, ten or twelve inches, laying them on a dry shelf a few day, or a week, or fortnight, according to their succulency, to heal over the cut part at bottom, as before explained, then let them be planted, all the tender kinds in pots of dry, light, rubbishy soil, either singly, if large cuttings, or the small cuttings, several may be planted in each pot, if required, closing the earth firmly about them at bottom and sides, and give a very moderate watering, then plunge

the tender kinds in a bark hot-bed, in the hot house, or bark pit, &c. or in want of this, in any common hot-bed under glasses; giving occasional shade from the fierce heat of the mid-day sun, till rooted: but where there is not the convenience of hot-beds, the cuttings of some of the hardier succulents, both of the open ground, and the green-house, will root with tolerable success in beds of natural earth or in pots, when planted in the advanced warm season, of spring and summer, April, May, June and July; allowing those of the green-house particularly, the protection of glasses, &c. occasionally, and in all wet weather, which otherwise would rot them before they take root, and let the whole have shade of mats from the mid-day sun, together with some very moderate waterings.

They will all root freely the same year, in a short time, especially those assisted by hot beds, so as the small cuttings that were planted thick together either in pots or beds, will be rooted sufficiently for transplanting, in August or September, &c. into separate pots if required, or where they are intended, according to their nature, whether tender for the green house and stove, or hardy for the open ground: and those not in hot beds, will also be rooted in tolerable perfection proper for transplantation in September and October, as above, or such as are in pots, may if thought proper, remain till spring following, then trans-

planted, if they require it, if not, remain till of a larger growth.

By cuttings of the young shoots of the same year in Summer.

In the propagation by cuttings, some of the hard wooded-tree and shrub kinds, succeed best by cuttings of the young tender shoots of the same year planted early in summer; and will take root the same year. And in most of the undershrubby tribe, such as sage, &c. cuttings of young shoots of the year in May, June and July, will grow freely; and in such of the herbaceous perennials that propagate by cuttings of the stalks or branches, the same years shoots in May and June, are proper for cuttings, and will also root the same season.

Some of the tree and shrub kinds, having their wood of a hard close texture, particularly some evergreens, that cuttings thereof older than two or three months do not root freely, or that root more abundantly well in the same years shoots in summer, than in those of a year or two old; and therefore the shoots of the same years production may be used for cuttings in June and July, and they will be rooted by the Autumn following; observing at the above time, June and July, just when the shoots of the year are become a little woody, cut off a quantity in lengths, as observed in the
pro-

propagation by cuttings of the year old shoots; and plant the hardy kinds in a shady border; the tender or more curious sorts may be planted in pots, and if plunged in a bark bed, or other hot bed, it will forward them greatly in rooting, giving waterings and occasional shade from the sun, till they get root.

Many of the frutescent or undershrubby evergreens, as sage, thyme, &c. also savory, hyssop, lavender, rosemary, and various others of similar growth, will also succeed abundantly well by cuttings of the young shoots of the same year in May, June, and July, planted in a shady border, or where they may be occasionally shaded from the summer sun till rooted; and be frequently watered.

By the above method of planting cuttings in summer of the same years wood, many sorts may be propagated, though it is only practised principally to such as will not root in the older wood, and to any choice evergreens in particular, that root sooner this way.

In the myrtle particularly, it always roots most effectually and expeditious in the young wood of the year, in June and July; when about three or four inches long, cut or slipped off from the mother branches; strip off the lower leaves, and plant them in large pots, many in each, inserted within an inch

of their tops, and about one or two inches asunder, and watered, then either plunge the pots in a bark bed, &c. or covered down close with hand glasses, or placed in a shallow garden frame, covered also with its proper lights or glasses, or oiled-paper, &c. See as directed under the article, *Propagation by cuttings of the year-old shoots*.

Many other exotic shrubs both of the green house and stove collections, and those of the open ground, may be propagated as above.

In the herbaceous plants, some perennials having abiding tops, as in pinks, &c. Others having durable stems and branches remaining all the year as in the wall-flower, balm of Gilead, double nasturtium, some geraniums, &c. as we before observed, may be propagated by cuttings of the young shoots of the year in May, June, and July, some those of the young side shoots, others by cuttings of the stems and branches, as in balm of Gilead aforesaid; likewise many sorts whose tops are annual, dying to the ground every autumn, and shoot up new stems in the spring, may also be propagated by cuttings thereof in summer, as in mint, balm, tarragon, penny-royal, and many others of that tribe; and by cuttings of the young flower stalks of the year, may propagate double lichnideas, double scarlet lychnis, and some others of similar growth that produce long, thickish, solid or fleshy stalks,
and

and which while they remain quite young and tender, and being cut off in lengths, and planted, will readily root at bottom the same year, and shoot at top.

So that all such of the herbaceous perennials, that may be propagated by cuttings of the shoots of the year, the shoots will be proper for this about May and June, just when they have acquired a little firmness and before they grow hard; and may be cut off in lengths from two or three, to six or eight inches according to the nature of growth of the different sorts.

For example:

In pinks and others of the like growth, the young side shoots from the head of the plant, mostly of the same years growth, will be of a proper growth in June and July for cuttings, when from three to four, or five, or six inches long; so cut them off at a joint a little below the middle, about two or three inches in length, strip off the bottom leaves, above half way the cuttings, and cut the remaining top leaves short, then having prepared some sifted, or well broken light earth, either in beds, or pots, &c. and the top smoothed, plant the cuttings by thrusting each into the earth, within an inch of the top, and one or two inches asunder, and give directly a moderate watering out of a watering pot with the rose or head on to settle the earth close and regular, about all the

cuttings, and to moisten the soil to facilitate their rooting: after this it would be of great utility to cover them close down, either with hand glasses, or with a shallow garden frame covered with glasses or oiled paper lights, as we have before mentioned, which will greatly promote their rooting considerably more expeditious and abundant, than if entirely exposed to the full air, observing to give occasional shade from the vehement hot sun in the middle of the day, and plenty of water: and they will thus be well rooted in six weeks, or may be greatly forwarded by plunging the pots in a hot bed; but in want of glasses to cover down the cuttings as above advised, plant them in a shady border, give water, and many of them will also grow.

Some other herbaceous perennials that shoot up with a single stem, branching out above into a bushy head, as in wall-flowers, in which the stem and branches remain all the year, producing numerous small side shoots from the year old branches in April, May and June, from two or three, to four, five or six inches long or more, which being cut or slipped off in the two last-mentioned months, and planted in a shady border, &c. will root the same year in a few weeks. Also in other plants rising with several stems of one or more years duration,

the

the young top shoots, as above, will form proper cuttings for propagation.

Observing therefore in herbaceous plants of the above nature of growth, having abiding stems and branches, they generally producing many side shoots in the spring arriving to a proper growth for cuttings, in the middle or latter end of May, and in June and July; which being three or four inches long, or more; cut off with a knife or slipped off with the hand, close to the mother branch or stem, clear off the lower leaves, if any, more than half way up the cutting, then plant them in a shady border or in pots of good earth, inserting them two parts of three or more, into the earth, giving water, and repeat it often in dry weather, together with occasional shade from the sun with mats to those exposed in a sunny situation; or let the cuttings, of any tender kinds particularly, be plunged in a bark bed, or any hot bed, to promote their rooting more expeditious and effectual: though the cuttings of hardy plants, such as wall-flower, and the like, will root freely in a shady border of natural earth, or in beds or pots of rich mold, shaded from the sun: and will be rooted fit to transplant the same year in autumn.

Some sorts of herbaceous perennials that rise with annual stems from the root every spring, will also grow by cuttings of the said stems in their young tender growth, in

the early part of summer; such as in mint and the like, which sending up many stems from the root in March and April, that will be of a proper growth in May and June, for cuttings; generally taking opportunity of moist weather, and cut up a quantity of the stalks before they become hard and sticky, divide them in lengths of six or eight inches, and plant them in beds, &c. of good earth, introducing each cutting half way into the ground, and give proper waterings, and they will soon take root and grow the same summer.

As to succulent plants, they having mostly durable tops, some sorts producing side-shoots, from their abiding stems, and branches, in spring and summer, may have them, cut off for planting the same year in June and July, observing before you plant them, especially the more tender very succulent kinds, to lay the cuttings upon a shelf a few days, or a week, or more, to heal and dry over the wound of the cut part at bottom, then plant them in a very light dry earth, in pots or beds, according as they are tender or hardy.

By large cuttings of the one, two, or several years old wood, cut in truncheons, poles, or stakes, &c.

In several of the soft-wooded tree kinds, of the aquatic tribe particularly, as the willow, alder, elder, poplar, &c. large cuttings of the one, two or several years old wood, cut off either in robust truncheons, two or three feet long, or in poles or stakes, of two or three yards in length, and of two or three inches thick, and planted in any marshy, watery or very moist ground, they will take root and grow freely in one season, and form well rooted plants, furnished also with strong shoots above: and thus such cuttings of these kinds of trees may be employed to advantage various ways, where a supply of large plants are required as expeditiously as possible, either for hedge sets, in the sides of ditches, or any moist situations, or to form pollards, or tall standards where wanted, either in wide rows, thickets, groves, &c. in low marshy or watery places, or along the sides of water: and for each purpose, the cuttings may be planted at once where they are always to remain.

For it is peculiar to the aquatic tribe of trees, or such as delight in watery places, that cuttings thereof, both of the young shoots, of one, or two, or several years growth, cut
in

in lengths of a foot or half a yard, to two or three yards long, will root freely when planted in any moist or marshy premises, and as before hinted, such large cuttings of willow, and alder, &c. may be employed to particular advantage, in several orders of planting, such as to form a sensible hedge, as expeditiously as possible or almost immediately fencible, in any watery, marshy situations, or along the sides of rivers, brooks, ponds, or ditches, &c. also occasionally the same kinds of cuttings, in large truncheons, to plant down low in the sides of banks of rivers, and other running waters, in particular places, where thought necessary to secure the banks from being undermined, and the soil washed away by force of the current; likewise in moist premises, cuttings of willow in long poles of several years growth, and two or three yards in length, or more, and two or three inches thick, to plant for standard trees, when required to have them form a large size, as soon as possible, planting them at once where they are always to stand, either to form headed pollard standards, to be kept to short trunks of six, eight or ten feet, for furnishing a supply of poles at top, for lopping every five, six, or seven years, more or less as may be required; or to grow up to a more lofty, large growth for full standards.

Thus,

Thus, in these kinds of trees, large long cuttings, of the above dimensions, may be planted at once where they are wanted; such as all kinds of willow, fallow, osiers, alder, birch, poplar, elder, &c. and most of which being of swift growth, are generally the most successful in any moist or boggy ground, where they will prosper considerably; even in places almost covered with water, especially the willow, osier, alder and birch, and in which situations they may be cultivated with little trouble after the first planting, and will yield considerable profit, both to cut for use, as underwood, rods, poles, &c. and in pollards, and full standards for timber.

When therefore it is intended to plant any large cuttings in truncheons, poles, or stakes, of the aforementioned aquatic trees, it may be performed in autumn or winter, about November and December, &c. in open weather, or early in spring, observing the method as below.

Truncheon cuttings, or such as are about half a yard, or two or three feet long, and an inch or two thick, may be of the large straight shoots, branches or poles, of one, two or three years growth, and an inch or two thick or more; and are proper to plant in any moist situation, either to form stools, for the production of twigs, rods, or poles to cut annually, or once in several years, for various purposes, as may be required,
or

or to form hedges both as outward fences, along ditch sides, or any moist places, where necessary, planted either into the bottom, side, or top of the bank of the ditch, as may seem most proper; and also to plant as division hedges, to divide any marshy grounds into compartments as required; or, also to plant towards the bottom of the banks of any running waters, to keep up the soil, and prevent its being washed away, as before observed, as they will spread and extend the roots in such an interwoven manner, as to keep the whole secure against the force of the current of water, and will produce a top growth to cut for poles, &c. as may be wanted.

For the above purposes let cuttings be procured of the proper lengths, half a yard or two or three feet long, as above mentioned; and if, preparatory to planting, the bottom or root end be sharpened, they in moist, soft, marshy soils, may be readily thrust or driven into the ground, without making any previous hole or aperture for their reception, inserting them half or two thirds of their length, but where the ground is hard or stubborn, it is adviseable either to dig the ground, or make holes for each cutting either with a large long dibble stake, or iron crow, or open separate apertures with a spade, so introduce the cuttings as above, closing the earth firmly thereto in a regular manner.

But if required to form hedges at once two, three or four feet high, may procure cuttings

in lengths of four, five or six feet, and plant them a foot or half a yard in the ground, either all upright, parallel to one another, or to render the hedge stronger, plant them slantingly, across one another chequer ways as before hinted; observing in either method to place them with the tops all an equal height.

When designed to have a plantation of pollard, or standard willows, or alders, &c. in moist situations, either to remain with full heads, or produce poles for lopping occasionally, may procure large cuttings of poles, two or three yards long or more, trim off all the side shoots, and shorten the weak tops, then plant them at once where they are to remain, making wide holes half a yard, or two or three feet deep, either with a long iron crow, or by opening apertures that depth with a spade, insert the cuttings, one in each hole, quite to the bottom thereof, and close the earth firmly about them, and they will root at bottom, and produce many strong shoots at top, and soon form large spreading heads, either to remain in that order of growth, or to lop the heads occasionally for poles, &c. if required, when of five, six or seven years shoot, or more or less, according as they may be required in regard to size for the purposes wanted.

Or if required to run them up to high standards, may lop the outward growths, the
second

second or third year, or sooner, and leave the straightest upright middle shoot for a leader, to run up for the elongation of the stem; permitting it to continue its growth in height to form high standards.

By cuttings of flower stems, of the same year in summer.

In some of the herbaceous perennial flower plants, the cuttings of the young flower stems of the same years production, planted in May or June, will readily grow and form good rooted plants, in six or eight weeks. Such as in the double lichnidea, double scarlet lychnis, double rockets, and several others with flower stems of similar growth, and is an eligible mode of propagation for such kinds of choice perennials flowers as do not furnish root off-sets, or proper side shoots, for slips, cuttings or layers, and in which case this method may be practised with tolerable success in many sorts of perennials.

The season for this is about May and June, when the main radical flower stems, or such as rise immediately from the root, are about half grown or but little more, while they are young and remain soft and tender, for when they are become hard and sticky, they will not succeed well for this purpose.

Observing therefore, at the above period of half growth, of the flower stems of the
respec-

respective plants that are to be propagated, let a proper quantity be cut off close to the bottom, and then in those that are long may cut them into two or more lengths, prune off the weak slender tops; then dibble them in a shady border, or in pots, &c. to have occasional shade from the sun till rooted, giving a proper watering; and then it would be of considerable advantage to cover them close down with a hand glass, to exclude the external air, whereby the cuttings will root much sooner and in greater perfection: or some in pots may be plunged in a bark bed in the hot house, &c. or in any hot bed, under glasses, or oiled paper, and covered also down with hand glasses as above, the assistance of the heat will greatly forward their rooting, observing in either method to give proper supplies of water.

Though in the hardy kinds, they will also sometimes root tolerably with only planting them in a shady border without the assistance either of glasses or hot beds: but notwithstanding where there are the convenience of hand glasses to cover them down, as above, they will more certainly emit roots much sooner and effectual.

They will all root the same season, fit for transplanting where wanted in two or three months.

In some perennials, cuttings of the main flower stems rising annually from the root,
is

is a principal method of propagation, such as in mint and others of like growth; which in May and June, having a quantity of the young stems, cut into lengths of six or eight inches, and planted in rows in any bed, or border, giving water, they will grow freely.

By cuttings of the main stem of several years growth in some particular plants.

Some succulent plants run up a considerable height with only a single stem, without producing either root suckers, or any side shoots or branches for cuttings or slips for propagation, as often prevail in the torch thistle, which rises with an upright thick fleshy, naked, angular stem, many feet high, erected like a column, and as it seldom furnishes side shoots, unless the top is cut off, that in order to propagate it, there is often no other resource but to cut off part of the top, as just observed, about half a foot, or a foot or two long, and to plant the cutting thus cut off, which will take root and grow; and the mother plant being deprived of its top, it will probably send out side shoots for future propagation; the same rule is to be observed and practised with other succulents of similar growth, i. e. that run with long naked stems, either

either erect or trailing, without furnishing side shoots, or suckers, &c.

The cuttings of the above kinds, should be taken off for planting in summer, or early part of autumn, cutting them clean off transversely, from about three or four, to six, or eight, or ten or twelve inches long, as they admit: or if cut off longer, may divide the cuttings into two or more lengths, then, as being very succulent, lay them in the dry a week or fortnight, to heal over the cut parts, and then plant them in pots of dry, light, rubbishy soil; give a very little water, and plunge them into the bark bed in the hot house.

There are many succulent plants of the above nature of growth, that when the top is cut off for planting as above; the remaining lower part of the old stem will often throw out some side shoots, both at the part whence the cutting was taken, and below; which, after having one or two summers growth, may be detached for planting for further encrease, if required.

Any other sorts of the succulent kinds, that advance with only a single stem, without any side shoots, or bottom suckers, may also be propagated as above by cuttings of the main stalk.

By

By cuttings of roots.

By cuttings of roots is a mode of propagation, occasionally practised or substituted in default of other methods, both in some kinds of trees, shrubs, herbaceous and succulent perennials, when they do not afford any other means by which they can be sufficiently multiplied, with any eligible success and abundance; and also, in some particular trees and plants that propagate by other methods rather reluctantly, or neither furnish seed for sowing, or that they are long in growing to perfection from seed, or do not afford suckers, off-sets, or any proper shoots for layers, cuttings, or grafting, budding, &c. they in these cases are propagated occasionally by root cuttings, and in others, particularly some herbaceous perennials, they are propagated abundantly both by top, and root cuttings, as in mint: and in some other perennials, it is the only principal method by which they are commonly propagated, as in potatoes, horse-raddish, and Jerusalem-artichokes and some others, also in liquorice which is always propagated by root cuttings.

However, in some scarce foreign tree and shrub kinds, the propagation by cuttings of the roots is often necessary, in default of other means, as sometimes seeds there-

thereof cannot be obtained, and the plants in their nature of growth neither afford suckers, or any proper branches or shoots for layers, cuttings, grafting or budding, &c. as aforesaid, and therefore there is no other resource, than to cut off pieces of the horizontal roots, or those near the surface of the earth, and the proper season for this operation, is in the spring about March and April, opening the earth to the surface roots, and with your knife cut up some that are about a quarter or half an inch thick, or but little more, in lengths of from three or four, to five or six inches, as they may occur, and plant those of the hardy kinds in a bed or border of light earth, inserting them in rows, wholly within the ground an inch or two deep, giving proper waterings, and they will strike root below and send up shoots above; or might be greatly assisted if planted in pots, and plunged into a hot bed, but for any tender kinds, or particular curious or choice sorts, the assistance of an hot bed is particularly necessary, planting the cuttings in pots and plunge them therein: give frequent moderate waterings.

But some hardy tree kinds, which propagate abundantly by other methods, are also sometimes encreased by cuttings of the horizontal roots, such as in elm, &c. which sends out many long horizontal roots running near the surface of the ground, which
being

being cut into lengths of five or six inches, and planted wholly into the earth, an inch or two deep, will take fresh root and send up shoots above.

In some sorts of American aloes, that neither afford suckers at bottom, nor shoots above, nor any seed, until they flower, which is seldom before they are near a hundred years old, their propagation is therefore sometimes effected by cutting off the large roots, that grow nearest the surface of the earth; and which may be performed in the spring, by opening the earth down to the uppermost roots, and of which cut off some of a quarter or half an inch thick, in lengths from three or four, to five or six inches, plant them in pots of light sandy soil, inserting them wholly into the earth an inch or two deep, as observed above, in the other root cuttings; and plunge the pots in a bark bed where convenient, and they will emit root fibres in the earth, and push out shoots above, and form proper plants.

The above method, though not always so convenient or successful as some other modes of propagation, yet as it often happens that no other methods of increase occur, in the plants above alluded to, it is worth the trial, and if only a few new plants can be obtained by that means, it may be considered as a sufficient recompence, in the scarce and curious plants particularly.

Some.

Sometimes these plants are propagated by cuttings of their thick fleshy leaves.--See *the Propagation by Cuttings of Leaves*.

But by the cuttings of roots, is the general method by which several plants are commonly propagated, such as liquorice, horseradish, potatoes, Jerusalem artichokes, as we before hinted, and some other sorts of running and knob-rooted perennials.

In liquorice, the main perpendicular root sends out many small horizontal ones, running near the surface; and notwithstanding they shoot up tall shrubby-like branchy stalks, these being only annual, rising in spring and decaying in autumn, the propagation of the plants can only be effected in due abundance by cuttings of the horizontal roots, which may be cut off from the old roots either occasionally as they remain in the ground, or when digged up for use; observing, the small side roots of a quarter of an inch thick, or the size of a moderate goose quill, are the proper sorts for cuttings, which you will cut into equal lengths of five or six inches, and then having digged the ground three spades deep in some large open quarter of a kitchen garden or field, there plant them at once where they are to remain, in rows two feet asunder, inserting the cuttings, by dibble, perpendicularly, wholly in the ground, an inch or two below the surface thereof, and a foot distance in the row; and if required, some may be

H planted

planted in a nursery as stools to furnish a supply of side roots for cuttings.

In three years the main roots of the liquorice will be grown to a proper size to dig up for use; the large perpendicular roots being the only useful parts.

By the above practice of planting, cuttings of the running horizontal roots, several other plants of the running rooted kind may be propagated, both of trees and herbaceous plants.

Horse-radish, and some other large, long, or chump rooted plants, as in monk's-hood, are commonly propagated principally by cuttings of the root, either the main root cut into pieces of two or three inches long, or cuttings of the top of the root, that length; or by cuttings of the small side off-set roots, cut off two or three inches long, with the top bud to each, especially in horse-radish; and the proper season for this work is any time from October or November, in open weather, till March or April; the method as follows:

The cuttings may either be cut from the off-sets of the main roots occasionally, as they remain in the ground, or the roots taken up, and the off-sets divided, or the old root cut into proper lengths; generally in the old roots, prefer for this purpose, such parts as are somewhat knotty or knobbed, or that are well furnished with eyes or buds, and cut each into several pieces, of one, two, or three inches

inches long, having one or more buds or eyes to each; or otherwise, in horse-radish, when the roots are digged up for the use of a family, may cut off the top part one or two inches long, with the top bud thereto, then plant them as directed below; or if you use cuttings of the small side shoots of the root, take the top part only, cut off about two or three inches long, with the bud at the top thereof remaining to it; and these are generally the best cuttings for a successful crop of horse-radish; then having obtained the cuttings in either of these methods, plant them, generally by dibble, in the places intended, inserting the horse-radish sets twelve or fifteen inches deep, or more, to obtain long, strait root-shoots for use; but other root-cuttings need not be planted, more than two or three inches deep.

But, as in horse-radish, a particular method of planting the cuttings is practised; observe the following directions:—Let the ground be digged two spades deep; then proceed to plant the sets therein, to remain, in rows two feet asunder, and a foot distance in each row; being for this purpose provided with a long dibble, make therewith a hole for each cutting, fifteen or eighteen inches deep, so as to receive the cutting quite to the bottom uprightly, with the crown or top thereof twelve or fifteen inches under the surface, that they may produce long, strait, upright

shoots of that length for use; drop a cutting into the bottom of each hole, and cover in the holes to the top, with the earth, and rake the ground even.

They will shoot up the same year from the bottom, quite through the earth, in long, strait root-shoots, which, in one or two summers growth, will acquire a large size, to dig up for use.

Potatoes and Jerusalem artichokes, and some other knob-rooted kinds, having the root full of protuberances and eyes, are commonly propagated principally by the root, cut into several pieces, having one or more eyes to each cutting; and the season for this work is principally in March and April, when having procured a quantity of middling large sound potatoes, or also of Jerusalem artichokes, &c. if required, and with a knife cut each into two, three, four, or more parts as they admit, so as each cutting have at least one or two eyes or buds, and directly plant them by dibble, where intended, according to what they are, either potatoes, &c. or any kind of flowering plants, inserting them three or four inches deep; and if potatoes and Jerusalem artichokes, must be in rows two feet asunder, but if flower plants, deposit them in the borders, beds, pots, &c. as it shall seem necessary.

But in the potatoes and Jerusalem artichokes, observe the following rules in planting the root cuttings: chuse an open space of light ground, dig or plough it properly in the spring, at the time for planting, then proceed to plant the sets either with a large blunt ended dibble, in rows two feet asunder, by twelve or fifteen inches apart in the rows, and from four to five or six inches deep, covering in the earth over them; or may draw deep drills with a hoe or plough, and drop the sets along the bottom, and draw the earth over them the proper depth.

They will come up in April or May, and in the early sorts produce young potatoes, in June or July, and the late kinds in August, September, and October.

Several other knobbed-rooted plants, such as monk's-hood, &c. as before observed, may also be propagated by cuttings of the root.

Likewise several creeping-rooted perennials, running in thick shoots under the surface of the ground, as in mint, &c. short cuttings thereof, planted in spring, summer, or autumn, will grow and multiply exceedingly.

By cuttings of rooting stalks and branches.

Many of the trailing shrubby and herbaceous perennials, either prostrating their stalks, branches, and shoots along upon the surface of the ground, or climb upon support, naturally emit roots therein at the joints as they advance in length, and being cut off at the rooted part in short lengths, and planted, each will become a proper plant.

In the shrubby plants of the above kinds, their trailing stalks, that have emitted roots in the ground, &c. may be cut from the mother plant in autumn, winter or spring, cutting them off at the rooted parts in lengths of six, eight or ten, or twelve inches, according to their growth, trim them as they may require, preserving the root part to each, and plant them in a nursery or where wanted, with their tops above ground, and they will soon grow and make great progress.

And in the herbaceous tribe, several sorts produce trailing stalks that root in the earth as they advance in growth, in spring and summer, which may be cut off the same season in lengths, as they admit, each furnished with roots, and planted in beds, borders, or pots, as may be necessary, according to the nature of the plants.

By cuttings of leaves.

Among the succulent tribe, some sorts neither furnish seed in this country, nor afford any means of propagation by suckers, off-sets, or shoots for cuttings, &c. as frequently prevail in the chiding aloe, and some others: and which having thick fleshy leaves, cuttings thereof, assisted by a hot bed will take root and grow.

This method of propagation being not always so effectual or successful as the other methods, is only recommended for occasional practice in default of all other means, as above suggested, and if but only a plant or two can be raised to encrease the stock, of these scarce kinds, it will be worth the trouble which is not great, especially where there is the accommodation of a hot house bark bed, in which to plunge the pots of cuttings, as they will generally root freer, in a kindly bark-bed heat than that of a dung hot bed.

It may be performed in the advanced part of the spring or any of the summer months; choosing some of the fresh robust leaves, and of which cut off the top part horizontally a few inches, or half a foot long or more, according to their growth, and lay them on a shelf in the hot house or any dry warm place for a week, till the wound or cut part

at bottom is perfectly healed and dried over, that no moisture issues therefrom, which would be liable to rot the bottom of the cutting after planting in the earth: then plant them in pots of very light dry soil, one in each pot, inserting the bottom end from one to two or three inches deep in the earth, according to their size, pressing the earth close about the cuttings, give a very slight watering to the earth, and directly plunge the pots into a bark bed: and if they are covered down with a hand glass it will conduce much to their rooting

Propagation by Pippings.

Pipping is a mode of propagation effected in the young shoots of the year of some particular sorts of herbaceous perennials, by detaching the top part of the shoot for planting; and is more particularly adapted to the propagation of pinks and some others of that nature of growth, and which may be encreased in great abundance by that method, so as to raise a large supply of proper rooted young plants in six weeks or two months, from June till August; and is performed on the same summers shoots, by detaching the upper part thereof, two or three inches in length, at a joint near the middle, either by pulling it clean out of its socket or sheath, and as it will thus leave a vacancy like a pipe, hence comes

comes the appellation of piping; or may be cut off at a joint with a knife like cuttings, and by either method the pipings being detached in June, &c. two or three inches long, planted and covered down with glasses, they will root effectually the same year, fit for transplanting in two months. See each method as below.

This is a very expeditious and plentiful mode of propagation; as we may raise a numerous supply of new young plants properly rooted and growing, in six weeks after planting: and is particularly calculated and practised in propagating all the curious varieties of pinks, as any desirable sorts, either of new seedlings, or any already acquired eminent variety may be raised abundantly, for the top of every shoot may be taken off, for a piping, and will grow freely and produce flowers next year, exactly the same as the respective parent plants, whence they were detached, and as the gardeners about London, raise vast supplies of all the fine kinds of double pinks for the markets, they mostly effect the propagation by pipings.

The proper season for this method of propagation is principally in June and the early part of July, when the young shoots have advanced from about three or four, to five or six inches long, and the sooner the piping is performed, after the shoots have acquired due size, the better, in order that

they may make good rooted plants, the same year before winter, and flower stronger the year following.

We will describe each method separately, viz.

1. By pipings pulled out of the socket.
2. By pipings cut off like cuttings.

First, By pipings pulled out of their sheath or socket.

This method is not so commonly practised as cutting them off: but may also be performed successfully with great facility and dispatch. And is performed by holding with one hand the lower part of each shoot, from which the pipings are to be detached, whilst with the other hand having the top between the thumb and fingers and pulling it gently asunder at a joint, near the middle of the shoot, it will most readily come out of its socket or sheath, then trim the pipings, by cutting off the soft bottom part near to the next joint, pull off the lower straggling leaves, and cut the top ones short, forming each piping about two or three inches long; and thus each shoot furnishing one piping, procure as many as is necessary for planting.

Then having for their reception prepared a small quantity of the best light rich mold, sifted or broken fine between the hands, either fill therewith some large pots, or form

it into a small bed, three or four feet width, for a garden frame, making the surface quite smooth, plant the pipings therein by thrusting them gently into the earth, they will readily make way for themselves, inserting them within an inch of the top, and about an inch or two asunder, giving directly a regular watering out of a watering pot with the head of the spout on, to settle the whole closely in the earth, and secure in their places.

As soon as they are thus planted, then cover the whole closely down with hand-glasses, or in want of these, place a shallow garden frame over, and cover close with the glasses or lights thereof, or with oiled-paper lights; which will exceedingly promote their rooting, keeping all quite close night and day, till the pipings are rooted and grow, giving daily waterings, and a moderate shade from the sun, just in the heat of the day only, and when the pipings are rooted and begin to shoot at top, give fresh air daily by tilting up the glasses, &c. and taking them quite off occasionally.

Second, The method by cutting off the pipings, for planting, instead of pulling them off, as above, is rather the most eligible of the two for general practice, though it only differs from the other method, in the order of the taking off the piping: observing as below.

Having a sharp knife, chuse the young robust shoots, and from which let the pipings be cut off horizontally at a joint near

the middle of the shoot; trim away the straggling bottom leaves, and cut the long top ones short, forming the piping about two inches long as observed in the former method, and having prepared a bed or some large pots or boxes of fine earth, plant the pipings by thrusting them into the earth, within an inch or less of the top, and only one or two inches asunder, if required to have many plants within a small compass for the better convenience of covering them with glasses, &c. for when thus covered down close from the external full air, it greatly forwards their rooting: give a good watering as soon as planted, out of a watering pot having the rose or head of the spout on, both in order to settle the earth regularly and close about all the pipings, and to moisten the soil to promote vegetation, and directly place hand glasses, or frames and glasses, &c. close over all the pipings, keeping them close down, as before advised, giving frequent waterings, and occasional shade from the hot mid-day sun.

If some pots planted with pipings as above, could be plunged into a bark bed of moderate heat for about a fortnight or three weeks, and covered also down with hand glasses, it would bring them forward in rooting.

Observe, in each of the above methods, it is adviseable to continue the glasses constantly over the pipings for some time, to exclude the outward free air, which will very
much

much facilitate their rooting; giving necessary waterings, according as the earth dries, also a slight shade of mats in the middle of hot sunny days, from about twelve to two or three o'clock, but before and after that time, permit them to have the full light and sun, and by keeping the earth always moderately moist, the glasses remaining close down, will soon force out roots below, and they will begin to shoot at top, at which time, be sure to admit fresh air, to strengthen the young plants, first tilting up the glasses, afterwards when the pipings advance more in growth, take the glasses quite off; still repeating the waterings as occasion requires, and the pipings, will thus in six weeks, or two months be well rooted, and considerably advanced in growth at top, so as to require thinning, when let a quantity be drawn out in a showery time, if possible, and planted in nursery rows six inches asunder, in three or four feet wide beds of good earth, giving waterings at planting, and afterwards as there is occasion, in dry weather; and let them here remain, some for two or three months, others for half a year or a year, to obtain strength; then may transplant some into the flower borders, and in pots, &c. and others may always remain in the nursery beds for flowering, but in the autumn or spring after they are raised, about October, November, March or April, a quantity of the strongest and
largest

largest bushy plants may be planted where required, observing at each time of transplanting to remove them with balls of earth about their roots, and plant them therewith in the places assigned them, either in the full ground, or in pots; and they will all flower the year following, but stronger and more abundant the second year.

Propagation by parting the roots.

The propagation of plants by parting the roots is by dividing the encreased side off-sets thereof into several distinct slips, when by such encreased off-spring, they are multiplied into large bunches; as occur in numerous species of the herbaceous, fibrous and tuberous-rooted perennials, and many of the under-shrubby tribe; the mother root emitting many side off-sets, furnished with distinct roots and top buds, or some also with heads or tops above ground, so as, in either case, to admit of being parted into so many separate plants, and thereby multiply their respective species and varieties, expeditiously in great abundance, as in the polyanthus, primrose, auricula, violet, daisy, chamomile, campanula, gentianella, catchfly, golden rod, perennial sun-flowers, perennial starworts or asters, strawberries, baulm, mint, penny-royal, and numerous other herbaceous perennials, which multiply considerably by rooted off-sets, or side slips, forming at once proper rooted plants,

plants, furnished, some both with root and tops, at the same time, others with only the root and crown buds, but which will shoot up to heads at the proper season; and, in most sorts, the young plants thus raised, will flower or attain good perfection the year following. Likewise in some of the under-shrubby plants, as above hinted, rising with several rooted off-set suckers from the bottom, with their top advanced considerably above ground, often forming, together, a thickety growth, such as in *Spiræa frutex*, St. John's wort, raspberry, dwarf box, sage, &c. which may be parted, top and root together to the bottom, into separate off-set slips, with roots to each, so as at once to form proper rooted plants.

As to the bulbous-rooted tribe they do not properly come under this method of propagation, but more eligibly under the *propagation by off-sets*, which see.

But in the herbaceous fibrous rooted perennials particularly, the propagation by parting the roots may be effected more or less, in the greater part of this very extensive tribe, some multiplying very considerably every year by bottom off-sets, or rooted young plants, emitted from the sides of the main root all around, so as often a single off-set of the root, will in one summer, furnish many new ones, emitted from its sides, of proper size to part off for planting in autumn following, and

that will flower the ensuing year, if of the flowery tribe: or if esculents will attain perfection in one season: others again encrease but sparingly by this method, and some scarcely at all naturally, without using some means to promote it, such as in some sorts that reluctantly afford bottom off sets, the cutting down the flower-stalks early in summer, before they have advanced much to flowering, by which check at top, the plants will often form root off-sets below.

All plants raised by parting the off-sets of the roots, are always sure to continue the same as the parent plant, in regard to every property thereof, either in growth, flower, fruit, variegations, &c. so that all plants, of any desirable kinds, both flowers and esculents, that afford root off-sets for parting, may both be abundantly encreased, and continued permanent in their respective species and varieties.

The general season for parting or slipping the roots of the herbaceous tribe is, either in autumn after the plants have done flowering, fruiting, or have finished their summer's growth, or in the spring before they begin growing, or very soon after, before they have made any considerable advance therein, or have pushed forth their flower-stems much for flowering. The autumn parting or slipping may be performed in September, October, and November, according as the flowering and general growth, of the

the different sorts of plants is over for that season, as above hinted; and the spring operation for the same work, may be commenced in February and March, and continued occasionally in different sorts till April, especially in the late shooting kinds; the above may be observed both in the hardy plants, of the full ground, and the tender kinds in pots, and in the green house and stove.

In parting the roots of the herbaceous perennials, it may be proper to remark, that as there are both of deciduous and evergreen kinds, there are some little difference to be observed, in parting or slipping the off-sets; the former (deciduous kinds) not only having their flower-stalks decay after they have done flowering, but also their leaves in autumn or at the approach of winter, so as only the roots and the crown buds thereof remains, as in everlasting sun-flower, perennial starworts, golden rod, &c. that in parting the root of these sorts for propagation in autumn, winter, or early in spring, when devoid of leaves, the slips or divided parts will consist only of the root, crowned with the buds of the future leaves and shoot, &c. and in the evergreen kinds, having the leaves remaining all the year, as in auricula, pinks, thrift, polianthus and many others; and that in dividing or parting the roots thereof, separate them

them with part of the head of leaves, attached to each slip where practicable.

The work of parting the roots may be performed, either by taking up the whole plant, with its entire root out of the ground, and then part, divide or slip it into as many separate slips with roots to each as it admits of, not too small, except where as great an increase as possible is required; or the main plant and root may remain in the ground, and part or slip off the out-side off-sets of the root; and thus may occasionally practise either method of parting the off-sets as shall seem most convenient, in the different sorts of plants, according to their nature of growth; and in either of which methods may occasionally slip or part them with the hand, or assisted with a knife or spade, as it shall appear necessary, the more slender rooted kinds can be often easily slipped off with the thumb and finger; but the large or strong rooted kinds, in which the slips firmly adhere, a knife will be requisite to separate them more effectually with a portion of root to each, or sometimes a spade, in very large clustered roots, being careful in either way to part them with as much root part as possible to each off-set: observing in those furnished with a top or head of leaves, detach them with the root and part of the leaves thereto; and in those without any present leaves be careful that each slip is furnished with one or more good buds, at top of the root.

Then

Then having thus procured the slips required, let them be prepared for planting, by cutting off any broken or irregular part at bottom, shorten straggling fibres of the root, and clear away decayed, and unnecessary under leaves and then plant them as below.

The planting them is to be performed commonly with a dibble; observing, some of the larger slips, may be planted at once where they are to remain in beds, borders, shrubberies, or pots, &c. according to what they are, and the uses for which they are required, and adapted; and the smaller slips, you may plant in nursery rows, six inches asunder, to have a summer's growth before planted out for good, then transplanted with balls of earth about their roots, to where they are finally to remain; or in any of the more curious or choicer sorts, the small slips may be set in pots, one, two, or several in each, as may be required if quite small slips, but when grown stronger are to be planted into separate pots; and slips of the tender exotic kinds belonging to the green house and hot house, should in general be planted in pots, either singly, or several in each, as a nursery till advanced more in growth, then transplanted into pots singly, observing in planting the slips, let those of the deciduous perennials, not furnished with a head or leaves be planted down, almost wholly within the ground, or with the crown of the
root

root an inch under the surface, or if they have any advancing buds or shoots, plant them accordingly, with these just out of the earth; and in the evergreen kinds, having a head of leaves crowning the root, plant them down to the bottom leaves close to the earth, and as soon as planted give a moderate watering, and repeat it as there shall be occasion till the plants have taken root, especially in early autumn and late spring planting.

In the undershrubby tribe, some sorts grow up with many small shoots from the root, which may be parted into so many separate plants with roots to each, and the season for performing it is in autumn or early in spring, either taking up the whole plant and divide it into separate off-sets, or slip them off as the main plant and root stands in the ground, by the assistance of a spade and knife, then trim the root as you shall see necessary by cutting off broken parts, and straggling fibres, all side shoots below, and weak or bowed tops: and plant them in the nursery way, or some of the largest where they are to remain.

Propagation by slips of the root and top, &c.

In many sorts of plants a plentiful propagation is obtained by slips of the young offspring, both of the root and top, and off set
young

young heads, produced from the crown and sides of the root, and head of the parent plant above ground, that may be readily slipped off with the hand, for planting as so many distinct plants, some with roots, others unrooted, but that will root when planted, both in many of the herbaceous perennials, and several sorts of shrubby plants.

Observing, as this method of propagation consists both of rooted slips rising immediately from the sides and crown of the root, and in unrooted slips, emitted in some sorts from the head of the plant just above ground; and some numerously, some from the sides of the stem, and branches, that, in all of which the young shoots of the year, or a year old are the proper growths to detach as slips, though root slips of one or two years old or more will also succeed, as they adhering immediately to the sides of the mother root, are always furnished with root fibres; also such young shoots as occur at the bottom of the plant near the ground sometimes have formed fibres in the earth, or if without fibres, those near the ground, are much formed for rooting, that being slipped off and planted will root in the earth and grow.

In many of the shrubby and under-shrubby plants, the unrooted slips of the small young side shoots of the branches both of the same and last years production, that

that being slipped and planted in spring, and summer, will readily emit roots and grow; and any choice or curious sorts may be greatly assisted by covering them down with glasses, or placed in a hot-bed, or assisted both ways, as occasion may require, as explained hereafter.

And of the herbaceous perennials, some sorts having a sort of undershrubby branches remaining all the year, as in wall flower, &c. produce many young shoots in spring, fit to slip in May and June for planting; and that will root freely and form good plants, the same year, proper for flowering in tolerable perfection the year following. Several others of a more herbaceous growth, as auriculas, pinks, house-leek, &c. that afford many bottom shoots for slips, issuing immediately from the side or crown of the root, sometimes furnished with root fibres, and some not, but being produced close to, or near the earth, the bottom is thereby formed of a rooty nature, that when detached and planted will emit roots and grow.

But as the propagation by slips may be comprised under the three following heads, each will be explained in its proper place, viz.

1. By slips of the root.
2. By slips of the bottom shoots rising from, or near the root.
3. By

3. By slips of the young shoots of the stem and branches.

In each of the above methods of propagation by slips, it is generally to be considered in performing the operation of slipping, that the shoots or off-sets proper for slips, may either be slipped off from the mother plant with the hand instead of cutting them off with a knife, as in the propagation by cuttings; and that the smaller off-sets, or shoots for this purpose, either of the root or top may commonly be detached or slipped with the thumb and finger, taking them clean off to the bottom, or to whence they proceed: or sometimes in slipping the larger off-sets and shoots, may use a knife occasionally to separate them more effectually where they are strongly affixed to the main root, &c. but the small young shoots of the head, stem or branches, may with facility, be mostly slipped with the hand.

First, By root slips.

By root slips many of the fibrous, and creeping rooted, herbaceous perennials may be propagated in great abundance: as vast numbers of this class of plants multiply exceedingly by small side off-sets, around the outsides of the main root or from the head thereof, produced in spring and summer, fit for slipping off with root fibres to each

each to plant for propagation, some sorts early the same season, others in autumn or spring following, as will be obvious by observing their growth; some forming the off-set shoots mostly of the root, with but little or no top above ground, at the time of slipping them, especially if early in spring, or late in autumn, or in winter, of the sorts that are deciduous, losing both their stems and leaves in the winter season, as in perennial sun-flower, starworts, mint and numerous others: and some consist both of root and top together, fit to be slipped in the advanced part of spring, as in mint, baulm, penny-royal, artichokes, polyanthus, pinks, daisies, chives, gentianella, campanulas, and many other perennials, both of the kitchen and flower garden, &c. sending up young shoots in March and April fit to slip off with roots the same spring for planting: and many other perennials afford rooted slips from the bottom furnished with tufty tops above ground, remaining all year, as in auricula, thrift, and numerous others of the evergreen herbaceous tribe, that may be slipped both in spring and autumn with roots and top to each slip.

So that it may also be observed that numerous herbaceous perennials produce plenty of bottom slips issuing immediately from or near the crown of the root, shooting with the top above ground in spring, or summer, as occur in many sorts whose top decays annually

nually in autumn, and that shoot up with new stems or heads in the spring, will be proper to slip the same year, in spring, when the shoots are only from about one, two, or three, to four, five or six inches in length above ground, especially those that run up wholly to stems, but those growing always low, may sometimes be either slipped the same spring, or not till summer, or autumn, or spring following, as you see fit; carefully slipping them clean to the bottom in separate slips, each with as much root as possible for planting; and in many sorts also with abiding tops, remaining all the year, and such as grow low and near the ground, as in auricula, pink, house-leek, and numerous others, the off-sets thereof, that arise from the head of the root, and shoot above ground with tops of but a few inches high, may either be slipped the same year they are produced, in spring, summer or autumn, or in the following spring, when a year old, as may seem expedient by the nature of growth of the plants, and the off-sets thereof, whether in shoots or heads; and so as they can be detached or slipped off clean to the bottom, with roots to each, or taken off so low that the bottom part affects a rooty texture, adapted to emit root fibres readily when planted.

Likewise many of the knobby or tuberous rooted perennials afford a supply of side
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root

root off-sets, or tubes of the root, to slip for propagation; as also many of the long carrotty shaped perennials, furnish side off-set root shoots, that will admit of slipping for encreasing the collection when required.

And in many of the under-shrubby tribe, as in sage, hyssop, thyme, southernwood, lavender-cotton, &c. shooting up quite from the bottom, admit of being slipped off clean to the root, with root fibres to each slip.

As to the proper season for performing the operation of slipping the roots, the early part of spring, about February, March, and April, before they begin to advance much in the spring shoot, is an eligible time for that work: or in autumn, after they have performed their summers growth; though some sorts of low growing plants, or that do not wholly shoot up to tall stems, but emit low side off-set shoots immediately from the root, may be occasionally slipped almost any time in spring, and summer, when the slips occur, when not shot above two, three, or four inches; especially if planted in a shady border; but in such as shoot up wholly to tall stalks, should generally be slipped either in the spring before they shoot much, or in autumn after the stalks decay, or in many hardy sorts of perennials, they may be occasionally slipped any time in winter, in open weather, such

as

as golden rods, asters, and perennial sun-flower, &c. though spring and autumn, are most preferable for that work.

The work of slipping the roots is generally understood to be performed while the mother plant and its root remain in the ground, slipping the outside off-sets therefrom without disturbing its growth; or the whole root may be taken quite up, if thought more convenient: but if the former, only let the earth about the slips intended to be detached, be opened more or less, as it shall seem necessary, so as to admit of detaching them with roots to each; then according to the nature of production of the off-set young plants proper for slips, emitted either from the sides or crown of the main root, or that either adhere close thereto, or are a little detached, or produced singly or in bunches, let them be slipped off accordingly with the thumb and finger clean to where they originate, or if very strong slips may assist with your knife in separating them from the mother root, when they will not readily slip off with the hand, being careful, in either method, to take each off with as much root part as possible, both such as are produced immediately from the sides of the main root under ground, and from the crown thereof, minding that each slip have one or more proper crown or top buds, or a head of leaves, or young shoots, &c. according to the nature of growth of the respective plants that are to be slipped; observing, of plants that are

to be slipped in the spring, which have made shoots of the year, they should be slipped when the shoots are not advanced above from one, two or three, to five or six inches, and being careful in general, when you have detached the slips, to close the earth in again about the roots of the old plants; or to gain a larger increase, may take up the whole root out of the ground, and slip it into as many as it will admit, with roots to each; or may also slip them into larger or smaller slips, either in separate off-sets, or in little bunches, as may be required for particular sorts or purposes.

Then, having obtained the slips, all furnished more or less with roots, they may be considered as forming at once so many distinct new plants, let them be prepared for planting, by trimming them, as they shall require; such as pruning away any broken or irregular parts of the root, shorten long straggling fibres thereof, and clear off any decayed, loose, broken, and straggling under leaves; and then plant the slips where wanted, either to remain, as in some of the larger slips of the more hardy sorts, or others plant in nursery-beds, or borders, or some in pots, as they require, according to the different species, &c. observing of those that are without any top when slipped, but being entirely root, to insert them wholly within the earth; and those furnished with top, plant them down to the first under leaves; or in-

set

sert them more or less into the earth, within one, two or more inches of the top, according to their size, length, and order of growth, whether as slender shoots, or robust tufty heads, &c. and plant them from about two or three, to four, five or six inches or more asunder, according to the different sorts, order of growth, and respective uses either as flowers, esculents, or shrubby plants: closing the earth about each slip, and give water: which you will repeat as occasion may require till they strike fresh root and grow, especially in the spring, summer, and early autumn slipping.

They will thus soon take fresh root, and form so many new distinct plants, and such as are slipped in spring and early part of summer, will, in many sorts, attain good perfection the same year, both in some esculents and numerous flower kinds.

In slipping the roots of creeping rooted kinds as in mint, &c. which shoot into numerous thick roots, may slip pieces of the running roots, either without any top, in autumn, winter, or early in spring, and planted an inch or two deep, they will readily grow and multiply: or in spring when they shoot up to stalks, two or three inches long or more, may slip off a quantity with top and root together and plant them.

In some herbaceous perennials they afford side slips of the root but sparingly, and in which to promote a larger supply, cut down

the flower-stalks early before they advance much in their summers growth, and they will thereby be encouraged at bottom, so as to emit side off-sets of the root, the same year for slipping early in autumn.

In slipping the knob and tuberous-rooted perennials, as also the carrotty rooted kinds, it is most advisable to perform it either in autumn, soon after they have effected their summers growth, or early in spring, before they begin to shoot either at bottom or top any thing considerably; though in the flowery tribe, of such whose stems and leaves wholly decay in summer after they have flowered, it is more eligible, generally to slip them in autumn, about August, September, or October, &c. or in spring before they begin to shoot again: and by which they will strike root more effectually, and grow stronger for flowering next year: observing, in slipping these sorts, that if performed while the main root remains in ground, open the earth about the encreased parts thereof whence the slips are produced, and slip off the increased side off-sets, according to their nature, either knobbed, tuberous, or carrotty shaped; or where as large an increase as possible is required, the whole root may be taken up out of the ground, as observed in the propagation by parting the roots, and then slipped into as many distinct parts, as it will admit, each having one or more buds for top shoots, &c. then in
either

either method, let the slips be planted where intended, either some at once where they are to remain, or in nursery beds, or some in pots as may be required, or as shall be necessary according to their nature, giving necessary waterings, and each will grow and form a proper plant, for the purposes intended or for which they are adapted.

In many of the low under-shrubby plants, as dwarf box, sage, southernwood, hyssop, &c. producing shoots directly from the root, furnished with rooty fibres in the earth, and which being a sort of suckers, may with facility be slipped off from the parent plant, clean to the root, so as each forms at once a proper rooted plant, for propagating their species; and being thus slipped and planted in the spring or early part of summer, they will make good stout plants the same year by autumn following.

In the bulbous rooted tribe, as crocus, tulip, narcissus, &c. they producing many young off-set bulbs of the root, fit to slip in summer when the plants are past flowering, and which may then either be occasionally slipped off with the hand, as the mother root remains in the ground when not intended to remove or transplant them, or otherwise the whole taken up, and the young increased off-sets slipped off from the principal bulbs, which afterwards plant again by themselves, and plant the slipped off-sets in nursery beds for a year, or till acquired a proper growth to flower
I 4 strong.

strong, then transplanted, when the flower and stalks decay, among the full blowing bulbs. *See propagation by off-sets*, in which that of the bulbous rooted plants is fully described.

Several of the succulent plants, afford root off-sets or young heads issuing immediately from the root like suckers, as in aloe, &c. and which may also be slipped off with roots to each, from the mother plant as it remains, without taking it up, or disturbing its growth: and the slips thus detached being rooted, they at once form proper plants that when planted, will readily grow without much trouble.

2. *By slips of the bottom shoots, rising from or near the root.*

As we before suggested, many sorts of both herbaceous and shrubby plants, produce supplies of bottom shoots, and off-set young heads, issuing, either immediately from or near the crown of the root, or head of the plant near the earth, in shoots entirely above ground; so as they may readily be slipped off in separate slips, either with more or less root, or sometimes without any, but growing near the earth and root, the bottom part inclining to a rooty substance, as observed on former occasions, are very much inclined to rooting when planted.

In

In the herbaceous perennials, numerous sorts send up many off-sets, in spring and summer, issuing from the sides and crown of the root, and form bottom shoots, or heads, above ground, that when from one, two, three or four inches long, are proper to slip, some sorts the same spring, others in summer or autumn following, according to their growth.

Observe, those that naturally shoot up wholly to stems in the spring, &c. and that when intended to propagate them by slipping the above ground young stem-shoots and root together, should be slipped for that purpose while the shoots are only from one or two, to three or four inches long, as above hinted, slipping them clean to the bottom, with as much root part as possible, or as near to the root as convenient, so as the bottom of the slip be of a somewhat rooty nature, and plant them where required, inserting them within an inch or two of the top, and give proper waterings.

Some other herbaceous plants, growing always low or near the ground, produce short robust shoots, and heads, either from or near the root, never exceeding a few inches length, as in auricula, polyanthus, pink, penny-royal, thrift, London pride, and many others of similar growth, which sometimes produce off-set shoots, either above ground, immediately from the root,

or from the crown of the plant, just above the surface of the earth, and which when from one or two, to three or four inches size, may be slipped either the same year, in summer or autumn, or next spring, when a year old : slipping them either clean off to the root, or as near the bottom as possible, that they may partake somewhat of the root nature as before advised ; and let them then be trimmed as required, by cutting off any broken or ragged part at bottom, clearing away any loose straggling bottom leaves, and plant them where required, according to their nature, or kind, inserting them within an inch or two of the top, more or less, according to their size of growth ; and give proper waterings.

In the low succulent plants, many sorts afford above ground shoots, arising from or near the crown of the root, that may easily be slipped off separately with roots to each, or that being taken off near the earth, have the bottom end of a rooty texture, adapted to send out root fibres abundantly, and all of which may either be slipped the same year they are produced, in summer, or autumn, or the spring following, when from one or two, to three, four, or more inches long, and plant them where required, according to the sorts, either in the open ground, or in pots, &c.

And

And in the low small shrubby plants many sorts rising with several off-set sucker-like shoots, quite from the root, that being slipped clean to the bottom, each will form at once a proper rooted plant, or other kinds having the lower branches and shoots produced so near the surface of the ground and root, emitting root fibres in the earth, so as they may be easily slipped off from the mother plant with roots to each, or sometimes without hardly any root, but by growing near the ground, the bottom acquires a somewhat rooty growth, so as it will easily put out root fibres, when detached and planted. So that observing, in all the above ways of slipping these kind of undershrubby plants, furnishing root or bottom slips, from or near the root of the mother plant, or near the ground, the proper season to slip them is principally in spring, about February, March, or April, or in autumn about September, or October, or some of the small evergreen shrubby plants, as sage, rue, savory, thyme, hyssop, lavender-cotton, box, &c. may be slipped as above, with success in the summer months; being careful in each way, to slip the shoots off close to whence they originate, either to the root, or near it, according as they occur; so as each slip may have some root to the bottom, or of a rooty nature; then strip off the

bottom leaves, if any, cut off any broken part at bottom of the slip, and plant them where intended; give water, and they will readily grow, and form each a good rooted plant, in one summer's growth.

All slips of choice or tender sorts being planted in pots, may, to forward their striking fresh root, be plunged in a bark bed, or any hot bed under glasses, &c. as also any that are not furnished with roots when slipped may also be treated in the same manner, which will run them more expeditiously.

3. *By slips of the head, stems and branches without roots.*

In many both of the herbaceous, succulent, and shrubby tribe of plants, they furnish shoots some from the head of the plant, just above ground, without any root; and others from the sides of the stems and branches also unrooted, and all of which being slipped off with the hand, when of a proper growth, and at a proper season, in spring, summer, and autumn, and planted in the shade, or where they may have occasional shade from the sun, in hot weather, they will emit roots in the earth and become proper plants.

Some herbaceous and succulent perennials of low growth, produce small tufty heads,

near

near the crown of the root, often however, wholly without any root-part, yet being slipped off close and planted, will grow, and which may be performed in spring, summer, and early part of autumn, not after August, and they will root freely the same season: let such therefore at the proper season, as above, according as the slips occur of a proper growth, from one, two, or three to several inches long, be slipped off separately, trim off any broken part at bottom, or loose under leaves, and plant them, the hardy kinds in a shady border, the more curious or tender kinds, set in pots to be moved also to the shade, give water, and repeat it moderately as occasion requires: or some of the more tender or curious kinds in pots, may be plunged in a bark bed in the hot house, which will greatly forward their rooting.

Many curious herbaceous perennials, may also be propagated by slips of the small young shoots of the year, issuing some from the crown of the plant above ground, as in pinks, auriculas, &c. others from the sides of the stem and branches, in spring and summer; and being slipped and planted in May, June and July, will strike root and grow, making good plants the same season; and some herbaceous plants having abiding stems and branches, or such as continue all the year, as in wall flower, &c. producing many
young

young shoots in spring, which in May and June, will be fit to slip off from two or three, to four, five or six inches long for planting and will strike root freely in a few weeks, and make good bushy-headed plants by autumn, that will flower in perfection next year, and is the only effectual method of propagation, by which to encrease the fine double bloody wall-flowers, for they will not come the same from seed, nor do they produce bottom, or root off-sets for slips.

So that, in herbaceous perennials in which it is intended to propagate them by the above ground slips, not furnished with roots, it may be observed that such slips are produced, some from the sides of the crown of the plant, entirely above the earth, sometimes in small robust off-set heads, in others, in more slender off-sets, and in some others, furnish slips of small slender shoots from the sides of the stems, others from the branches of the head; and in all of which they may be most easily slipped off with the thumb for planting.

In the wall-flower, sage, and many other herbaceous-undershrubby perennials with stem and branches, &c. remaining all the year, many young shoots are produced from the sides of the branches in the spring, growing several inches long by May or June, and at which time are proper for slips; chuse the more
robust

robust young shoots of from about three or four, to five or six inches long, slip them off with your thumb close to the mother branches whence they arise, and having slipped a quantity let the lower leaves be stripped off more than half way up, then plant them in a shady border four, five or six inches apart, inserting each two part of three or more into the earth, or may plant some in large pots, several in each, and placed in the shade, give water as soon as planted, and repeat it often in dry weather ; and they will soon strike below and shoot at top, and form handsome plants by autumn, when a parcel of the best may be transplanted singly into pots, finally, to remain, both for the convenience of moving them under shelter in winter, when severe frost prevail, and in which to continue for flowering, in order to place in fore courts, or where required in assemblage with other flowers.

Some sorts also of the more herbaceous perennials having abiding or evergreen tops, as auriculas, pinks, &c. may slip off young shoots, of one, two, three or four inches long, in April, May, and June, and plant them in a shady border, or in pots, placed in the shade, or shaded occasionally from the mid-day sun, will take root and grow ; but the young shoots of the year, in pinks, &c. slipped off in May, June and July, two, three, or
four

four inches in length, and the long tops of the leaves shortened, then planted thickly in a bed, or pots of fine earth, inserting them therein within an inch of the top, give water, and cover them close with a hand glass, they will root in a short time. *See the propagation by pipings.*

In some sorts of annual flowers with branchy heads and firm shoots, slips of the young shoots of the branches will grow, and by which may propagate them to stand all winter, to flower early next year, particularly in the chrysanthemum, of which, if required to propagate some of the finest full double kinds, may in September and beginning of October, slip off a quantity of the robust shoots of three or four inches long, strip off their under leaves, and dibble them into some large pots of light earth, many in each pot, planting them down within an inch or two of the top, give water, and place them in the shade, till the middle of October, or may be placed under a frame and glasses, or covered with hand glasses, to forward their rooting stronger, before winter; and about the middle or latter end of October, let the pots containing the slips be either removed into a green house, placed near the front, or in a garden frame, defended in bad weather in winter, with the glasses, &c. but exposed in all mild dry days,

days, and in either method the slips will be well rooted, and advanced in growth at top by next March or April, so as in May, some may be planted into the borders, others in pots singly, and they will flower sooner by a month than seedlings: and with a certainty of their flowers being of the same doubleness as those of the parent plant, whence they were taken.

Several of the succulent plants of the green house and stove collections, growing up with stems and branches of various singular growths, that emit a production of many side shoots from the stem and head, proper for slips, to detach for propagation of the respective sorts; and which may be slipped either in spring, summer or autumn, when they occur of a proper size, from one, two, or three, to six inches long according to their nature of growth; carefully detaching them close to whence they originate, without tearing that part of the mother plant to which they adhere; and if they are of a very succulent kind, full of humidity flowing at the bottom part, that was affixed to the plant, lay them upon a shelf in the dry, a few days or a week, or more, till that part is dried and healed over to prevent its rotting when planted, then plant them in pots of dry light compost, and if plunged in a bark bed, &c. it will forward their rooting.

Of

Of the shrubby and undershrubby plants, many sorts may be propagated by slips of the young shoots of the stem and branches, both of the same year, and those of a year old, such as myrtle, rosemary, lavender, southernwood, rue, box, sage, hyssop, winter savory, thyme, geraniums, cistuses, and several other of the small shrubby tribe: and in all of which the method consists of slipping off with the thumb and finger the small side shoots, close to the mother branches; either the young shoots of the same year's production, in summer, about May, June, and July, as in propagating sage, myrtle, geranium and various other small, moderate growing evergreen shrubby plants, and others of slender growth; or the full-grown summer shoots, in September, October, &c. also by taking the year old shoots, in any of the spring months, February, March, April, or May, &c.

Observing in slipping any of these shrubby kinds, in either of the above ways, to chuse for slips, principally the moderate growing side shoots, that will readily slip off without tearing the bark or wood of the mother branch, and such that are from about two, three or four, to five, six or eight inches long, according to the nature of growth of the respective plants, carefully slipping them off clean to the part whence they proceed; divest them of the under leaves, and
may

may then give each a gentle twist in the lower end, and then dibble them in a shady border, the hardy kinds, the others may plant in pots, several in each, introducing them two thirds or more into the ground : giving waterings at planting, and afterwards as it may be required keeping the earth always moderately moist.

Or the slips of any choice or tender shrubs being planted in pots may plunge them in a bark bed, in the stove or where convenient, which will forward them exceedingly in their rooting.

In the myrtles great numbers may be raised by the slips, both of the young shoots of the same year, in June and July, &c. and of the year old shoots, in spring about March, April and May.

The young shoots of the year will be fit to slip in June and July, when about two, three or four inches long, slipping them off carefully with the thumb and finger, close to the branches, strip off the bottom leaves, give a slight twist in that part, and dibble them into large pots of good earth, an inch or two asunder, and inserted in the earth within an inch of the top, give water and they may either be plunged in a bark hot bed, which will make them very soon strike root; or in want of this, in any other hot bed, under frames, &c. and may also cover them down with a hand glass, to make

make them root sooner; or in default of any hot bed, let them either be covered down with hand glasses, as above, or placed in a garden frame, covered with its proper lights, or oiled paper, &c. observing in either, or all of which methods, to supply them often with water, and the slips will root freely the same year, in a few weeks, and shoot at top, fit to pot off separately next autumn or spring.

But as slips of the one or two year old shoots, cannot either be so easily detached, without damaging the old branches, nor will they root so freely without the aid of a hot bed, let a quantity of the moderately strong shoots, of three, four, five or six inches long, be carefully slipped or cut off, then strip off the lower leaves, and plant them in pots, two parts of three into the earth, give water and plunge the pots in a bark bed, or other hot bed under glasses, or may also cover down the pots close, with hand glasses, to exclude the outward air, which will contribute greatly in forwarding their rooting.

By slips also of the yearling and year old shoots as above, the geraniums and many others of the shrubby plants of the green house and stove, may be propagated, in spring and summer, planting them in pots, and if plunged in a bark bed, &c. and managed as above for the myrtles,

ties, they will strike root freely and grow at top, so as to make handsome little plants the same year, especially those planted in spring and early part of summer.

Likewise in several of the hardy tree, and larger shrub kinds of the open ground, slips of the small young shoots, emitted from the knotty parts of the stem and branches will also succeed, planted either in the spring, before they shoot, or in autumn, at the fall of the leaves; such as in the codlin, currant, gooseberry, and some others of the soft wooded tribe, in which the small young side shoots of one summer's growth, produced from the knotty parts of the old-wood, and of from six or eight, to ten or twelve inches long, may be detached as slips in the autumn after they are produced, about October or November, or in spring in February or March following, and planted in a shady border, in rows six inches or a foot asunder, inserting them half way or more into the ground, many of them will root and grow freely.

Likewise in several of the evergreen kinds, slips of the young shoots of the same year in summer, about June and July will grow; also the full grown moderate shoots of the same summer, in autumn, about September will likewise succeed; and also the small year old shoots of last summer, planted in spring, in March and April, will sometimes grow
by

by slips, but the young shoots of the year, generally prove more successful. Observing generally in all of which to chuse principally the small or moderate side shoots of the branches, &c. of from five or six, to eight or ten inches long, slip them off carefully, pull away the lower leaves, and then plant them in a shady place; giving occasional waterings in dry weather, and many of them will grow and make good plants.

Or some young slips of the same summers shoots, or the small year old shoots, in spring, of any curious sorts, being planted in pots, may be plunged into a hot-bed, it will promote their rooting much sooner.

Propagation by off-sets of the roots.

By young side off-sets of the root, a vast family of the herbaceous perennials, are abundantly propagated both of the fibrous, tuberous, and bulbous rooted kinds, as all of which generally afford a progeny of young root off-sets annually issuing from the sides of the parent root, in spring and summer, attaining a proper growth for separating therefrom either the same or the following year in summer and autumn, when the plants have done flowering, and their stalks and leaves decay; or in some sorts in the spring,
before

before they shoot or advance much above-ground ; and each off-set forming at once a distinct, new, already rooted plant, that will assume the same growth in all shapes as its respective parent, any desirable species and varieties may with facility be thus propagated or multiplied, with a certainty of having all the young plants, so obtained, retaining all the peculiarities of the original or mother vegetable, either as flowers or esculents.

The off-sets consist some of many small fibrous parts collected into a head, &c. as in the fibrous rooted perennials : others of thick tuberous and knobby fleshy parts, as in the tuberous rooted kinds, in some sorts distinct, and some consisting of many small tubers joined at top in a head or bunch, others of long fleshy fangs, and carrotty shaped parts, as in the tap-rooted plants : and in numerous sorts, the off-sets consists of small bulbs as in the tulip, and all others of the bulbous-rooted tribe.

In the fibrous rooted perennials, having the roots consisting of many small fibres, vast numbers multiply in great abundance by root off-sets issuing from the sides of the main root, often increasing into large bunches, that may be separated into many distinct young plants ; such as in perennial sun-flower, golden rods, and numerous others with fibrous roots.

Most

Most of these fibrous rooted kinds, may be separated or slipped into distinct off-sets, either just after they have done flowering in summer and autumn, taking opportunity of showery weather; or may be performed both in the spring, about February, March, and April, before they begin to shoot any thing considerably above ground, and in autumn when done shooting and flowering, &c. for that season, any time from September, till October or November; or some of the very hardy kinds may have the off-sets separated any time in open weather after flowering in autumn, till the spring; and in performing which, may either separate the off-sets as the old plant remains in the ground, or take the whole up, divide it into distinct off-sets, and in all of which, they may be either slipped off or parted with the thumb and finger, or in the large or strong rooted kind, may assist with the knife and spade, as occasion may require, detaching them clean to the bottom in separate off-sets, each with as much root as possible, and plant them directly, the hardy kinds, in beds or borders, and the tender or choicer sorts plant in pots, inserting all the root part under the earth, and if dry weather, may give some water at planting, and afterwards as there may be occasion.

In planting the above off-sets, the smaller ones of any curious particular sorts, may be first planted in nursery beds, or borders, in

rows

rows five or six inches asunder, or others in pots; but the larger well-rooted off-sets, may be planted at once where they are to remain, and those in the nursery beds after having one summers growth, will have obtained strength; and in autumn or spring, may be transplanted where they are finally to stand.

In the tuberous-rooted plants having roots either of thick fleshy tubers, as in peony, or of knobbed or thick, knotty or fleshy parts, as in anemone, cyclamen, &c. or of many minute oblong tubers joined at top, in a bunch, as in ranunculus; and in various other modes of growth in the different tuberous kinds; they increasing by root off-sets more or less every year, in spring and summer, may be occasionally separated either the same or following year for propagation, observing generally, that the proper season for separating the off-sets of these kinds, is principally to be performed soon after they have done flowering, in summer and autumn, and when their stalks and leaves decay, after having finished the summer's growth, at which time the roots cease growing, and remain for some time in a state of rest, at which period, may either have the off-sets separated as the mother root remains in the ground, as in some large sorts, or in the smaller kinds, to perform it more effectually take up the whole root;

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large

out of the ground, then separate the smaller off-sets from the main root, and may either plant the whole again directly, the off-sets in separate beds, borders, or pots, &c. as they require; or in some sorts, as anemones and ranunculus, that being taken up and slipped at the above period of rest, soon after flowering, they may be kept out of the ground several months, if required; or till October or November, &c. though it may be more eligible to plant the off-sets soon after they are detached, in nursery beds separate from the main roots, in rows four or five inches asunder, to have a years growth, then transplanted where they are intended to flower, and in their turn will afford a supply of young off-sets for further propagation.

The grumous-rooted plants, such as the ranunculus, &c. above mentioned, and others of that tribe, having roots formed of many small tubers joined in a bunch at top, produce off-sets of the same form, which should be separated, by taking up the main root, when the flower is past, and the leaves decayed, when having detached the off-sets, may plant them singly in nursery beds, till the decay of the leaves next summer, then may be taken up and planted as full blowing roots.

Some granulous rooted plants are very prolific in minute root off-sets, such as
the

the white saxifrage, having clustered roots, consisting of a multitude of small parts like grains of corn and which when the flower is past in summer, and the leaves decayed, may either be taken up, and a quantity of the off-sets or encreased parts separated, or some parted off, as the main roots remain in the ground; and plant them in small clusters of several granules together in pots, &c. they will flower next year and multiply in off-sets.

In tap-rooted perennials being such as run down in the earth with long thick roots, as in horse-raddish, fennel, skirrets, and some others, they often afford off-set root shoots from the sides of the main root, and by which they may be propagated in autumn, when the leaves and stalks decay, or early in spring before they advance in growth, either occasionally slipping some sorts, as the main roots remain in the ground, or in others take the whole up, and slip of all the side off-sets, and plant them with a dibble where intended, according to their respective uses either as esculents, or flowers, &c.

Many perennials having roots formed of long fleshy forked fangs, joined in a head at top, and which multiply by side off-sets thereof: and they may be slipped for propagation, as soon as they are past flowering and their leaves decay, in autumn &c.

or early in the spring before they begin to shoot, and plant them directly for the purposes intended, either as flowering plants, or medicinals, &c.

The geniculated or jointed rooted perennials, growing in thick knots and joints, also furnish root off-sets, either to slip off in separate heads, or in default of such, may slip or break some of the roots off at the joints, in autumn or spring, and directly planted, they will grow: and each form a proper plant.

Creeping rooted perennials sending out many thickish roots horizontally near the surface, as in mint, &c. which encrease considerably by off-sets, which may be slipped for propagation both in spring, before they shoot or advance much in growth; or in the autumn, when the stalks and leaves decay; and at which times, opening the earth, and either slip off a quantity from the old roots, or take the main root up, as many as required, and slip them wholly into as many parts, as may be necessary, or as they admit, either in smaller or larger portions as required, and let them be directly planted, either in shallow drills, laying the slips horizontally along the bottom, or may be planted by dibble, an inch or two deep, &c. they will readily grow, and multiply according to their mode of growth.

Propagation by off-sets of bulbous roots.

Bulbous rooted plants are mostly very prolific in off-sets, young bulbs issuing from the sides at bottom of the main bulb, as in tulip, narcissus, hyacinths, crocus, and all others both of the tunicated and solid bulbs, as also all the squammous or scaly rooted bulbous tribe, as white and orange lilies, crown Imperial, and other liliaceous kinds: all or most of which being perennials or at least in the root or bulb, it multiplying by a progeny of off-set young root bulbs annually, perpetuates and propagates the number of species from year to year, and greatly encreases the store; for although in some sorts, the same individual bulb exists but for a certain time, some not more than a year, as generally prevail in the tulip, others several years, yet they all, previous to their dissolution, furnish a successional supply of off-set suckers or young bulbs, emitted from the sides towards the bottom part of the parent bulb; so as what at the end of several years, is often considered as the same individual root, is in reality another, formed of its chief off-sets produced among the other young off-spring bulbs, as above; each off-set however retaining all the properties of the mother plant, producing exactly the same sorts of flowers both in regard to size, colour, stripes,

or variegations, so that every variety, of any bulbous flowers, may by the off-sets, be both multiplied, and continued the same in all respects.

The proper season to separate the off-sets of bulbous roots, is principally in summer and autumn, as soon as they have done flowering and the flower leaves are decayed, or withering away; which denotes that the bulbs have effected their summers growth, and that then they assume a state of rest for some time, drawing no nourishment from the earth, and during this period of rest, is the only best time to detach the off-sets for propagation; though in some large sorts the outer off-sets, may be slipped off without taking up the parent bulb, if thought inconvenient or improper to remove them; however, most bulbous roots, should be wholly taken up every two or three years to separate the off-sets, especially such as encrease considerably into large bunches; but some of the choicer varieties of the more capital sorts, should be lifted annually, soon after they have flowered to have the off-sets taken off, and the beds, &c. new prepared for the main bulbs to be planted again in autumn, &c. such as in the fine sorts of tulips, hyacinths, narcissus, jonquil, and others that are curious in their kind.

It is of consequence when intended to take up bulbous roots for separating the off-sets, or to transplant the main bulbs
into

into new prepared beds, &c. to be careful to perform it only principally soon after they have done flowering, or when the stalks and leaves also fade, as the roots then lose their old fibres, and cease to grow, so as they may be removed without the least injury; and also, if required, may be kept out of the ground for autumn, winter and spring planting, but if permitted to remain in the ground any considerable time after they have done flowering, they push forth new fibres and assume a fresh growth, when it would be too late to remove them successfully that season, which would greatly check the flowering bulbs, as they having then began to form the bud for the future flower, and if removed would either prevent their flowering the ensuing year or occasion them to flower very weak, and not increase so well in off-sets; but being taken up for separation of the off-sets, &c. at the proper period or interval of rest from vegetation, they will endure to be kept out of the earth several months if required, especially the flowering bulbs, and will shoot with more vigour when planted again in autumn, which is the principal season to plant the general supply of bulbous roots, though it is proper to allot a smaller portion for spring planting, in January or February to yield a successional bloom, after the autumnal planted flowers are past.

Generally chuse dry weather for taking up the bulbs for separating their off-sets, &c. and with a scooped garden trowel, or small spade, for larger bulbs, carefully dig them up, the mother bulbs and off-sets together, without bruising or cutting them: and let all the off-set bulbs attached to the main or mother roots, be slipped clean off separately, so as each main bulb remains single and clear of off-sets, which, if two or more adhere together they should also be separated into single bulbs; keeping all the mother bulbs by themselves, likewise the larger off-sets capable of flowering next year, may be kept in a separate parcel to plant, as immediate flowering bulbs; then they may either all be planted again directly or in a short time after, or not till autumn, if the place is not ready for them; observing to plant the smaller off-sets in nursery beds, &c. in rows five or six inches asunder, either by drawing drills two or three inches deep, so placing them in the bottom of the drill three, four, or five inches asunder, and draw the earth over them; or may plant them with a blunt ended dibble, the above distance and depth: the larger off-sets, may be planted at once where they are to produce their flowers; and those planted in nursery beds, may, next year, or the year after, when grown to full size, be also planted among the other flowering bulbs, where they will blow in their proper season, and in their

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turn will multiply also by off-sets for further propagation of their respective species and varieties.

In some of the large sorts of bulbous rooted kinds, the off-sets may be occasionally separated without taking up the main roots, if required not to disturb them, or have the trouble of replanting them; such particularly as several of the lily tribe, and the narcissus kinds, and any other large common bulbs, that are dispersed about the borders, &c. and where by the increased off-sets they are grown into large bunches, and in which, may detach the outside off-sets as they stand in the ground: which should be performed in summer, &c. soon after the flower is past, and when the stalks and leaves decay: open the earth away around where they grow, down to the bottom of the bulbs, then slip off all the outward off-sets: they will readily separate, draw in the earth again about the remaining bulbs, and plant the off-sets as advised above, the smaller ones in nursery beds, the others where they are required to flower.

But, for the general part, when bulbous roots are increased considerably by off-sets, into large bunches, they should mostly be taken wholly up, to separate all the off-sets, some every year, others once in two or three years; for when the off-sets are numerous they crowd and press so closely, they starve one another, and although they produce many

flowers together in a bunch, they will be inferior in size and beauty; so that the capital sorts of tulips, hyacinths, jonquils, poliantho-narcissus, &c. and some other choice kinds, should commonly be taken up annually, to be cleared from all off-sets: other sorts that are dispersed in patches, &c. about the borders, may be taken up once in two or three years, &c. according as they may be more or less multiplied by off-sets, and which should generally be performed soon after the flower and leaves of the respective species fades, which in some sorts will be early part of summer, such as in most of the spring flowering bulbs, others not till the middle or end of summer.

But in the autumnal flowering bulbs, such as colchicums, autumnal-crocus, autumnal-narcissus, Guernsey and Belladonna lilies, &c. they mostly produce their flowers at one time and the leaves at another, the flowers appearing in August, September, and October, naked or unattended by leaves, and when the flowers decay, the leaves in some sorts issue from the root soon after, others not till the following spring, continuing their growth to May or June then wither, and the bulbs are at their full growth, and which is the time for taking them up to separate the off-sets, or new plant the main bulbs or to be kept out of ground a month, or two, &c. if required, but must be planted time enough
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the ensuing autumn, to flower the same year, so should be planted in the end of July and beginning or middle of August, especially the colchicums, and all the other autumnal bulbs should be put in not later than the end of August, and as to the off-sets of these sorts, they may be planted, either as soon as separated from the main bulbs, or in a fortnight, month, or six weeks after.

In the kitchen garden there are some bulbous perennials increasing greatly by off-sets, such as shallots, and that diminutive bulb cives, the former requires to be taken up annually in summer, the off-sets separated and the large bulbs reserved for use, and the smaller planted to produce the yearly crop: but as to the cives, they may be permitted to remain several years unremoved, or till grown into large bunches, then should be parted, by either taking them wholly up and divided into smaller portions and replanted, or the outside off-sets slipped as they remain in the ground. *See each as below.*

The shallot being in great esteem for its bulbs to use in cookery, it should be planted every year in spring, the off-sets being planted singly, at small distances, each increases the same year into a large bunch of bulbs, of full growth in July or August, when the leaves begin to wither; and should then be taken up, and the bunches divided into separate bulbs, reserving the largest for family supply, and the best of

the others keep to plant for next year's crop.

They may generally be planted in the spring about February or March, or where the ground is light and dry, may plant them in the autumn, soon in November, allotting them a moderately light soil in the kitchen garden, divided into four feet wide beds: and having the shallots in single off-sets, they are to be set in rows eight inches asunder, and six inches in the row, and about two inches deep, inserted either with a blunt ended dibble, or thrust into the earth with the finger and thumb, if a loose light soil, or in drills drawn two inches deep with an hoe, and when the sets are placed, draw the earth over them, the depth of the drills; they will shoot up in April and May, into many long slender leaves, and the root will increase below into many distinct off-sets, forming a large cluster of bulbs, attaining full growth in July and August, and the leaves will then wither, which denotes the roots have done growing and arrived to perfection to dig up for use.

The cives, a sort of onion, being valued only for their early young leaves in spring, in lieu of young onions, never bulb in the root, bigger than peas, but multiply exceedingly into a large bunch composed of numerous small off-sets, close together, and by which they may

may be propagated most expeditiously in great plenty.

They may be slipped for propagation either in spring or autumn, or almost any time in open weather; performing it either by occasionally taking up the bunches, and part them into smaller portions, or the bunches remaining in the ground, may slip off the outside off-sets around; generally in parting or slipping them, preserve eight or ten of the small bulbs or off-sets together in a bunch: and in that manner planted in little bunches a foot asunder every way, to admit their growing into tufts, agreeable to their nature of growth, for they will multiply very fast, and continue for years.

Propagation by cloves of the root.

In some of the bulbous-rooted plants, the main bulbs, being composed of many smaller ones called cloves, all closely connected together within one general cover, appearing as if but one large bulb, as occur in garlic, and rocambole, and which admits of being divided into so many separate cloves, to plant for propagation, each clove will form a proper plant, and in one summer increase like the parent to a large bulb comprised of many lesser ones, as above.

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The proper season for performing this method of propagation is either early in the spring about February or March, or in autumn in October or November, though the spring rather more eligible for planting garlick, and the rocambole will succeed rather best if planted in autumn.

At the proper season procure some good bulbs of garlick and rocambole and divide them into as many separate cloves as they admit, then having prepared four feet wide beds of good earth in the kitchen garden, plant them in separate beds, in rows either by dibble or in drills, eight or nine inches asunder by six inches in the row, and two deep, and rake the beds smooth.

They will shoot up in April and May, leaves and stalks, and the root will encrease in its compound bulbous order each to one main bulb, composed of many small cloves, as already observed, arriving to maturity to take up for use in July or beginning of August, discovering full growth by the leaves and stalks turning yellow and withering.

Propagation by young bulbs produced on the flower-stalk.

Among the bulbous rooted plants, there is a tribe denominated bulbiferous, from their bearing young bulbs annually upon their flower stalks, and by which they may be propagated, as each young bulb forms at once a distinct plant, exemplified in rocambole, and some others of the garlick family, and in the *Lilium bulbiferum*, or bulbiferous lily, and some others of the bulbous rooted class.

They producing the bulbs in summer, some at the summit of the stalk, in the flower-umbel, as in rocambole, several of the moly kind, tree onion, &c. others at the joints and forks, of the stem, and flower branches, arrive to a proper growth the same season, in July and August to detach for planting.

For this purpose permit the flower stalks to stand for some time after the flower fades, probably a fortnight or three weeks or more, till the young bulbs acquire full growth, and begin to harden and assume a brownish hue, when the stalk will also shew signs of decay, which is notice that their produce of bulbs, &c. have attained their full perfection, and then may be detached

tached from the stalk and separated into distinct sets for planting, previously spreading them in the air to harden a little, after which may either plant them directly or kept in the dry two or three weeks, or a month or more, as may be convenient, then planted.

They may be planted first in nursery beds, especially the smaller bulbs, of those of the flowery tribe, in rows six inches asunder, either in drills drawn with an hoe two inches deep, and covered in with the earth; or planted by dibble that depth: and there let them have a year's growth, by which they will have acquired a proper size and strength to transplant among other flowering bulbs in the borders, &c. taking them up, for this purpose generally in summer, when the stalks and leaves decay, as advised in the propagation by off-set bulbs of the root; and plant them where intended, either directly or soon after, or may be kept in the house till autumn about October or November, when the borders, &c. can be conveniently prepared for their reception.

But as the rocambole is often required for family use, a due quantity of the best top bulbs, may be planted annually in the kitchen garden in beds, in autumn or early in spring, placing them in rows six or eight

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eight inches asunder, and an inch or two deep: they will shoot up in the spring to stalk, and produce heads of ripe bulbs in July and August.

Propagation by runners, and running rooting shoots.

Some herbaceous perennials produce long stringy shoots, running along the surface of the earth, rooting therein as they advance; such as in strawberry, which propagates very abundantly by that method, as well as by off-set suckers from the roots; for they annually send out many long strings or runners in summer all around, formed into many joints, and at each of which emitting roots in the ground, and a small head of leaves above, they thereby form so many distinct plants properly rooted, and fit to detach for propagation the same year, any time from June or July, till the end of September: though, if in the two former mentioned months, a quantity are planted off in nursery rows in a shady border they will make strong stocky plants, for planting out finally in autumn, and will produce fruit some the same and next year as in the alpine or monthly strawberry: and in
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the other sorts, will bear plentifully the second year.

Thus may the strawberry and other perennials producing runners, and creeping rooting shoots be propagated, though the manner of the strawberry runners are almost peculiar to that genus of plants, in their long slender stringy growth: other perennials producing also running trailing shoots, rooting in the earth, as they encrease in length, some at the joints only, others all along the shoot, so as they may easily be taken up with roots, and divided or cut into distinct sets for planting.

But with regard to the strawberry or any other running kinds of that order of growth, the propagation by the runners may be performed either as soon in the summer as the runners of the year have shot into lengths of two, three or more joints, that are rooted in the earth and shot out above, at each joint, or may be effected in autumn about August and September, &c. when the runners are advanced to full growth: however, for the strawberry in particular, I should advise to take off a quantity of the strongest well formed runner plants, in June or July, being careful to raise them out of the earth, at each joint with all the roots they have made, then divide them into separate, rooted plants, trim away the running stringy part, close to the joint or head

of the young plants, and then plant them by dibble in a shady border, by way of a nursery for the summer, in rows six inches asunder; give a good watering at planting, and let it be frequently repeated in dry weather, till the plants have got fresh root and grow; keeping them well cleaned from any strings or runners, they send out during the summer, and they will thus grow strong stocky plants, fit to plant out finally in beds, where they are to remain, next September or October, and make much finer plants than when they are suffered to grow all summer on the beds, in a thickety order among the old plants: however, when it is omitted planting off any, in a nursery as above in summer, a parcel of the strongest well grown runner plants may be collected in autumn, in September or October, &c. or in spring, about March or April, but preferable if the early part of autumn, and planted at once in beds, where they are to remain.

Any other plants of the running or trailing kinds, with radicant or rooting shoots, may also be propagated thereby, either in summer, when advanced to a proper growth, or in autumn or spring, taking up a quantity of the shoots with their rooted parts, and divide and trim them as they admit according to their growth, into distinct plants or sets, each

each furnished with roots, and plant either in the nursery way, or the large strong plants where they are finally to grow.

Propagation by crowns of the fruit.

The propagation by crowns of the fruit, is applicable principally to the pine-apple, which always produces a crown of leaves, affixed to a thick fleshy basis or receptacle, placed upon the top of the fruit, and being detached therefrom forms a young plant for planting, which although destitute of roots, it by aid of a hot bed, will root effectually: and in two years, produce as good a fruit as that from which it was itself produced, having a crown also at top of it, for further propagation; for the propagation of pines by crowns, is equally as eligible as by suckers, in forming as good plants, though not so abundant, because there are often many suckers afforded from one plant, and as there is never more than one fruit, consequently each plant furnishes only one crown, though sometimes several small suckers issue from the bottom of the crown that are also proper to plant for propagation.

The season for this method of propagation is principally in summer and autumn, when the pine apple arrives to maturity, for the crown does not attain perfection before the fruit is ripe, nor indeed should it

it be taken off before, otherwise it would spoil the growth of the apple.

According therefore as the pine apples ripen and served up to table for eating, the crown should at that time be separated from the fruit, by a gentle twist, it will readily quit its hold; then, being returned for planting, pull off the lower outside leaves, and previous to planting, lay them upon a dry shelf to heal over the bottom part, that adhered to the fruit, as being generally very succulent or full of sap, would be apt to rot it when planted, if the above precaution was omitted. So that having lain a few days or a week to dry, prepare to plant them in small pots of rich light mold, one crown in each pot, first observing to cut off any rugged hard part at bottom, and make an opening with the hand in the middle of the pot of earth a little depth, plant the crown therein close in the earth well around it, give directly a moderate watering and plunge the pots in a good hot bed under frames and glasses, either the bark-bed in the stove or in a horse-dung hot bed, supporting the heat thereof when declined, by application of substantial linings of hot dung to the sides of the bed, and give a moderate admission of fresh air in fine sunny days, by tilting the glasses, one two or three inches, as required: though
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it must be admitted with great caution in winter, and only in very mild, sun-shining days, for two or three hours in the warmest time.

In the spring or autumn following when the crowns are advanced much in growth, they will require to be shifted into larger pots; and in performing this, turn them out of the present pots with the ball of earth about the roots, and plant them with it entire, into the larger pots, giving water, and plunge them in the hot bed, and in half a year, after they will want shifting into the pots where they are to remain to fruit.

Propagation by grafting.

Introductory observations.

The propagation by grafting is applicable only to the woody tribe, in raising the desirable varieties of many sorts of trees, and shrubs, both in fruit trees, and in many of the more curious varieties of the ornamental and forest tree kinds, as well as in some of the green house, and stove woody exotics, and in all of which it consists of engrafting a young shoot of the tree intended, into the stalk, stem or branch

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branch of another of the same family : the graft unites therewith, shoots up and commences the new tree, and thereby proves a most sure mode of propagation by which to continue every variety so raised, with certainty the same as the approved parent tree, from which the graft is taken.

For as the operation of grafting, consists of taking some cuttings of young year old shoots for grafts in the spring, from any desired tree, curious for its fruits, foliage or flower, &c. and which young shoots, being parts exactly similar to the whole tree whence taken, retaining all the properties thereof, will continue unalterably the same when ingrafted into the proper stocks, i. e. the stem or branch of another tree, of the same genus or family, raised either from seed or suckers, &c. to a proper growth, and the head being then cut off, and the graft inserted at top, as hereafter fully explained, it uniting with the stock in which it is so engrafted, in a month after, pushes forth shoots the same year, a foot or two long, becomes a new tree, that will prove the same in every respect of growth as that from whence the grafts were detached, producing invariably the same kind of fruit, or leaves or flowers, &c. according to what it is, either a fruit, ornamental, or forest tree; without partaking in the least of the quality of the stock upon which they are grafted. Hence appears the vast importance

tance of the operation of grafting, in propagating any desirable varieties of curious tree and shrub kinds.

For, as we explained under the article of raising trees from seed, the seedling trees never hold to the same sort, which render the operation of grafting of such great utility; by which every sort is propagated with permanency in its respective kind. But for raising stocks, to graft the desired sorts of trees upon, they may either be raised from seed, or suckers, or cuttings, or layers, &c. as thought most expedient or convenient: though seedling and sucker stocks, are the most commonly used for general grafting.

But the propagation by grafting is more particularly applicable and more generally practised in raising many varieties of fruit trees, than in the ornamental trees, and shrubs, or forest trees, &c. which are only propagated by grafting occasionally in some particular varieties, of singular properties, and that either do not furnish suckers or layers, or that do not succeed by layers or cuttings, or any other eligible means of propagation, by which they can be continued the same in their respective singularities, such as any curious striped or variegated leaved kinds, or any that are remarkable for their flowers, either in size, number, colour, variegation, or doubleness, or such other eminent varieties,

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possessing any admired peculiarity either in growth, foliage, flowers, or fruit, &c. may in all those cases be propagated by grafting, with a certainty of continuing them always the same; or, even in such similar varieties, as also admit of propagation by suckers, layers and cuttings, with permanency in their respective properties as above, the propagation by grafting may also be occasionally practised, when thought more expedient, in raising any valuable variety; but except in the above case, of particular varieties of certain species, the general supply of both ornamental trees and shrubs, and forest trees, are commonly raised by other methods, as by seed, suckers, layers, cuttings, &c. only observing that as several species thereof, are prolific in varieties, any choice or capital kind, may be continued permanent by grafting: however, in fruit trees, several capital sorts require to be principally propagated always by grafting in all their varieties, such particularly as apples, pears, plums, cherries, &c. each of which species furnishing many varieties of their respective fruit, originally obtained accidentally from the seed, kernels, or stones thereof sowed, and as they will not come the same sorts again from seed, but of very different varieties, probably of very inferior quality, grafting is therefore a most

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certain method of propagation to continue each desired variety distinct.

For although it may be observed of all our present collection of fruit trees, and other tree and shrub kinds, prolific in varieties, that their respective varieties, were mostly obtained by seed, either accidentally or by the process of regular cultivation of sowing at different times for many years past; and still more new ones are acquired by the same means: yet there is no certainty of obtaining an encrease of any of the said varieties, continuing of the same sorts without variation, in endeavouring to propagate them by seed of their respective kinds; for from the seed of one and the same tree, many different varieties are often produced, more especially in the tribe of fruit trees, and probably not one of the same sort as the original or parent tree; but sometimes out of many, a new variety of merit may occur, and when any eligible new variety is thus acquired, the tree may be encreased at pleasure, so as to produce always the same sort of fruit, leaves, flowers, &c. by grafting shoots thereof in stocks or young seedling or sucker-raised trees of the same family.

As to the proper stocks on which to perform the grafting, they must be principally young trees, either seedlings, raised from the seeds, kernels, berries, nuts, stones, &c.

of the several respective sorts of trees of the same family, or by layers or cuttings, as may be most convenient: all of which for stocks, must be of the same family or genus, or a very near kindred of the same botanic class, at least, as that of the tree, with which you intend to graft them; otherwise they will not succeed; remarking however, that although the different species of trees belonging to the same genus, agreeable to the botanic characters of their flowers and fruit, will take by grafting and budding upon one another, yet for the general part the several varieties of each species, are the most successful upon stocks of their own kind, as for example in fruit trees, all the different varieties of apple should be grafted upon any sort of apple tree stocks, raised either from the kernels of crab apples, or of any sorts of cultivated apples indifferently: the same of pears, plums, cherries, and all other tree and shrub kinds, intended to be propagated by grafting; this being of much importance to be observed.

For, notwithstanding that grafts will also take upon different species of the same genus, such as apple upon pear stocks, they will not be near so successful as upon stocks of the apple kind, as before observed; pears likewise generally succeed best upon pear stocks, raised from the kernels of any sorts of pears, also very well upon quince stocks,

which are occasionally used to dwarf the trees for walls and espaliers, &c. and plums, although they will grow upon cherry, and the cherry upon plum stocks, yet each succeed considerably better upon stocks of their own kind, plum upon plums, and cherry upon any sorts of cherries: though for curiosity may have different varieties of the same species, grafted on the same tree, both of fruit trees and others, such as golden pippin and nonpareil apples, and other different sorts on one tree, the same of pears, plums, cherries, &c. on each of their respective species, or may have different species of fruit of the same genus upon one tree, as pears, apples and quinces on the same stock, of any of these kinds, and plums, cherries, and apricots on the same plum stock or tree; the same of peaches, nectarines, and apricots, all upon one tree; and so of most other fruit-bearing, flowering, and other tree and shrub kinds, as are either generally or occasionally propagated by grafting, if it is observed to have stocks of the same genus as the graft; though not in all cases so successfully as upon their own particular stock, principally of the same species or variety.

However, for general practice, one graft of a sort is sufficient upon each stock, and is the most eligible in the propagation of the

the general supply both of fruit, and any other kinds of trees, by grafting.

And generally always have small stocks for general grafting upon, that is, of from about a quarter or half an inch to an inch thick in the part to be grafted, whether low in the stock for dwarf trees, or at several feet height for standards; though stocks of two or three inches thickness, will also succeed by particular methods of grafting, but not for general practice.

But sometimes in fruit trees particularly, the propagation by grafting is also occasionally performed upon large stems and branches of old trees, that already bear fruit, which are either ill bearers, or by age or infirmity are worn out, and that you either intend to renew it with young bearers, or intending to change the sorts of fruit, in the whole, or of any particular branches, or for curiosity, have two or more sorts on the same tree, such as different sorts of apples, or apples and pears, as being both of the same family; and so of any others, as plums and cherries, they being likewise species of one genus: though the varieties of each respective species, generally succeed best distinct, as apples upon apples, pears upon pears, and so of most others, and principally one sort only upon each stock or tree.

However, for the general grafting, have always a supply of young stocks, raised either from seed or suckers. &c. as before

observed, and carefully remember, as already hinted, to have them always of the same genus or family, as that of the respective trees, from which the grafts are intended to be taken for grafting, or very nearly allied of the same class and order, agreeable to the botanic characters of the flowers in regard to their general structure, and to the number of stamina or filaments and pistillums, in the center; and generally whether of the kernelled fruit, as apple, pear, &c. or of the stone, berry, or nut, capsule, or pod kinds; for no trees of both a different genus, and class, and order, will grow by grafting on one another; though some sorts being of a different genus, but of the same class and order, will succeed, such as a peach upon a plum, or an apricot, they being of different genera, but of the same class and order (*Icosandria monogynia* flowers having twenty stamina and one style) the peach being of the genus *Amygdalus* or almond, and the plum and apricot belong to the family of *Prunus* or plum-tree.

As however, many of our capital fruit trees are propagated principally by grafting, it will be proper to describe the proper stock on which to graft the different sorts with some general hints for those requisite for other trees and shrubs propagated by grafting.

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That for apples in all the numerous varieties the only proper stocks, are those raised from the kernels of any sorts of cultivated apples, or the wild crab, which generally proves the hardiest stock; and to dwarf the trees for espaliers, or half, or dwarf standards, the codlin apple stocks in particular, are used, raised from suckers of the root and stem which readily grow; also for very small dwarfs, may use the Paradise apple stock, raised by layers or cuttings, it being of a low diminutive growth, is productive of very dwarf trees for low espaliers: or for small gardens, or for curiosity to plant in pots, &c.

For pears raise stocks from the kernels of any of the pear kind; and to dwarf the trees for walls and espaliers, may use quince stocks raised from seed, layers, cuttings, suckers, &c. or will succeed upon white thorn or medlar stocks, but these two being of a different genus, though of the same class, are not so eligible.

For cherries, the stocks raised from the stones of any sort of that fruit are proper, or for common standards, may use chiefly the wild black cherry stock, as the most durable, and to dwarf the trees for walls, espaliers, &c. use stocks raised from the stones of any of the common garden cherries, or particularly the morello cherry, but any others will do: and to have quite dwarfish trees, the common and canada bird

cherry stocks, raised from the stones, layers or cuttings are proper, they will produce diminutive trees, eligible to plant in pots, for forcing, or in the borders of forcing frames, or to fruit in the open air, for curiosity. Or cherries will also take upon plum and laurel stocks, being all of one genus, or may have each sort all on the same tree, for experiment and variety, but are always the most successful on their own stocks for general practice, one sort only on each stock.

For plums, raise stocks from the stones of any varieties of the fruit, or by suckers from the root of old plum trees or will grow upon apricot and cherry stocks, for variety, as being all of the same genus, or may have them three on the same tree, for curiosity; but the plum is always most successful and durable on its own stock, and which is the only proper stock for the general propagation of plums by grafting.

Medlars succeed both upon their own seedling stock, or any of the medlar kind, and upon white thorn or pears, though of different genera, but nearly allied of the same class; and may all be raised for stocks from the kernels and seed of their fruit; but the medlar trees are generally more free of growth when worked upon their own or pear stocks.

The cultivated or sweet service will take either upon their own seedling stocks, or pear, medlar, and hawthorn, which though

of different genera, are of the same class, and nearly allied by their botanic characters, and will succeed upon either, but most successful on their own or pear stocks.

Filberts may be grafted upon suckers or seedling stocks of their own kind, or upon those of any of the hazle nut tribe, raised from the nut or suckers.

Wild service tree will graft either upon its own seedling stock, or the hawthorn, &c. being of the same genus. Also upon pear and medlar, though of different genera, but of the same class.

And quinces will grow upon their own and pear and medlar stocks, all raised from the seed of the fruit.

In all other tree and shrub kinds, in which any curious varieties are propagated occasionally by grafting, either of the pleasure ground or forest tree kinds, or of the greenhouse and stove collections, must observe the same care, that the stocks on which to graft the respective sorts, be of the same family; for example, to graft any of the variegated leaved holly, or any particular variety of that tree, must have stocks raised from the berries either of the common sort, or any of the holly tribe, observing the same rule of other eminent varieties of any particular species of other genera of trees, &c. where grafting them is intended; such for instance, to graft the variegated-leaved

fycamore, being of the maple family, have stocks raised from seed, either of the common fycamore or any of the maple species, the most conveniently obtained, and so of all other kinds designed to be propagated by grafting.

As to the methods of raising the different sorts of stocks, on which to graft the varieties intended, is principally by seed and suckers; and sometimes by layers and cuttings, especially when a particular sort of stock is required, and that cannot be obtained with certainty by seed and suckers; but for general supply, raise them from seed and suckers, and from seed most of all.

The raising them from seed is by sowing the kernels, stones, nuts, berries, &c. of the fruit, of the sorts intended, either in autumn or spring, in four-feet wide beds of light earth, in drills, or on the general surface, and covered down an inch or two deep: observing the same time of sowing and general methods, as directed under the article of *Propagation by seed sowed in beds and covered in with the rake and spade*, they will come up in spring, or early in summer, and in autumn, winter, or spring, be fit to plant out in nursery rows, two or three feet asunder by half that distance in the row, in the manner advised under the above mentioned article of propagation by seed; and should be trained each with a clean single stem, to
from

from two or three, to four, five, six or eight feet high, and when from two or three, to five or six years old, of from about a quarter or half an inch to an inch thick, or but little more, in the part where the graft is to be inserted, either low for dwarf trees, or high for standards, as before suggested, they will be of eligible growth for the work of grafting, as explained under the different methods of performing that operation.

Sucker stocks are obtained by digging up a due quantity of suckers, arising from the roots of such trees, that are of the same family as the respective trees intending to graft from; let such be chosen that are only of one or two summer's growth, and take them up in autumn, winter or spring, with as much root as possible, trim off side shoots, from the stem, or if any have weak or crooked tops prune them down, and cut off any knots of old root adhering; then plant them in nursery-rows, as observed above for the seedlings, train them up in the same manner each to one single stem; and they will be fit to graft in a year or two, for whip grafting particularly. See the operation.

And to raise stocks by layers and cuttings, is performed by laying the lower straight young shoots, in the earth in autumn or spring, or plant cuttings of the robust shoots in the same season, as directed under the articles of propagation by those two methods.

thods ; they will be rooted by autumn following, then planted in nursery rows, previously cutting off any side shoots, leaving the top leader, if strong, and if not, prune it, that it may push out vigorously, training the strongest shoot thereof for the stem; and managed as directed for the seedling stocks; and they will all be fit for whip grafting in a year or two, or any other grafting, when of older growth, near an inch or more thick.

The stocks in general designed to form dwarf or low growing trees, or for common wall trees and espaliers will be proper for grafting, at two or three years old, of a quarter or half an inch thick, when about two or three feet high; but for half and full standards, must have from three or four, to five or six feet stems, or more, of half an inch or inch thick in the part to be grafted; and the grafting performed near the top.

Performing the operation.

The season for performing the operation of grafting is February and March, and the young shoots of the last summer's growth, are the proper parts to use for the grafts or scions with which the grafting is to be performed: and which should be collected from the respective trees in February, before the buds thereof swell considerably or advance for shooting, taking none but the young shoots
of

of the former summer, as just above remarked, not more than one year old, of robust moderate growth, situated chiefly on the outer branches, and such as have not made any lateral shoots the year before, cutting them off at full length for the present, and when collected, may be tied in bundles, and deposited with the lower ends in a border of dry earth and taken out as wanted for grafting.

Next observe, the following implements and materials are necessary in general grafting.

That for performing the operation, have a strong knife for cutting off the heads of the stocks, ready for grafting, and one for shaping the graft, and sloping the stock for its reception in whip grafting, &c. and a strong knife being also necessary for cleaving large stocks in cleft grafting, for the admission of the graft or scion; a small hand-saw for occasionally heading large stocks, in grafting upon the stem, or main branches of old or large trees; and a flat grafting chissel, and small mallet, for clefting large stocks when too stubborn for a knife, together with some new bass-mat for ligatures to tie the grafted parts close.

Likewise, for the finishing part, a quantity of well-wrought tough clay, to cover round the parts of insertion of the graft, to defend the whole from the injuries of the
wea-

ther, as wind, sun, air, wet and cold, and for which necessary purpose, having some tough binding clay, or stiff fat loam of a clayey nature, adding thereto about a fourth part of horse droppings free of litter, with some cut hay, working the whole together in an heap, and applying some water, well beat it with a strong stick several times, for two or three days, always moistening with water at each beating.

Grafting being performed by several different methods, each is explained, under the following heads, viz.

Whip-grafting		Side-grafting
Cleft-grafting		Cheek-grafting
Crown-grafting		Root-grafting

A N D

Grafting by approach, or inarching.

But whip-grafting and cleft-grafting are the most eligible for general practice: the others being only practiced occasionally in particular cases as explained under their respective heads.

All the methods of grafting must be performed in the spring, about February or March, remarking that for pears, cherries, plums, and other early shooters, February or beginning of March is eligible, and almost

most any time in March will suit apples and other late shooting trees.

Observe, of the several methods of grafting, that when designed to have dwarf trees, for common wall trees and espaliers, the grafting must be performed low in the stock about six or eight inches from the bottom, that they may furnish the first branches, in a regular spread, near the ground; and dwarf standards are grafted at a foot or two high in the stock, half standards three, or four, or five feet height, and for full standards both of fruit trees and others that having tall stocks, must graft at six feet from the ground: though sometimes standards are grafted low in the stock; and the principal shoot from the graft is run up to form the stem the height required; but it is generally more eligible to have the stocks form the stem and graft them at the height the stem is intended, either for half or full standards.

First, *By whip-grafting.*

This method of grafting being always performed upon small stocks, from about a quarter to half an inch or near an inch thick, or but little more; or if nearly the size of the graft will be very eligible: though stocks of about half or two thirds of an inch, &c. is the most general and successful method, or if necessary, may whip graft on the
young

shoots or small branches of any bearing tree, when required to change the sorts of the fruit, or have two or more varieties on the same tree.

Begin by cutting off the head of the stock at the height intended for dwarfs or standards, &c. by the rules before explained, then, on a smooth side of the stock at top, make a clean sloping cut upward, about an inch and half or two inches long, and make a small slit near the top of the slope, about half an inch downward; being then ready for the graft, which shorten to four or five eyes, cut the lower end sloping, fitted exactly to the sloped part of the stock, and cut also a small slit upward forming a tongue, to introduce into the slit part thereof, then directly applying the graft, insert it with the tongue into the slit, of the stock, making the cut parts join even and close, with rind to rind at each edge, and tie them together with a ligature of new bass, brought several times round, and immediately clay the whole an inch thick on all sides, and above and below the grafted parts, closing it perfectly well and smooth in a globular or oval form, and to remain thus until the middle or latter end of May, when the grafts will have effected their junction with the stock and begin to shoot, then the clay may be removed, but permit the bandages to continue two or three weeks longer.

They

They will shoot the same year, permitting the whole to take their full growth all summer; and if required to have them form a full head, may prune each shoot in spring following, to four or five eyes or buds, to obtain new lateral shoots; afterwards managed as directed under the heads, *First pruning, General pruning, &c.*

Secondly, *By cleft-grafting.*

This method of grafting is practised upon larger stocks of an inch or two thick, by cleaving the stock down the middle for the insertion of the graft.

Proceed by cutting off the head of the stock at the proper height for dwarfs and standards, as before observed, then cut one side at top sloping upward, about an inch and half, and then with a knife or chissel cleave the stock at top cross ways the slope about two inches down, keeping it open with the knife, chissel or a wedge, to receive the scion or graft, which being cut to four or five eyes, slope the lower end on two sides an inch and half or two inches long, forming it with a thin inner edge, the outer much thicker, and with the rind thereon, and immediately ingraft it into the cleft of the stock, at the back of the slope, with the thick edge outward, the rind thereof even with the rind of the stock,

stock, rind to rind, and removing the knife or wedge, the stock will close firmly upon the graft; binding them closely with bafs, and clay the parts over with a good coat as in whip-grafting, and managed in the same manner.

By this method of grafting, may ingraft large stocks of one or two inches thick or more, likewise large branches of bearing trees, either to renew the bearing wood, or to have a different variety of the same sort of fruit; also by this method, when intended to graft any pretty large stocks, may have two, three or four scions or grafts in each, either all of the same sort, or different varieties; cutting off the head of the stock horizontally, and without sloping it, cleave it quite across, inserting a graft on each side, or if cleft twice, may introduce two grafts on the opposite sides, or occasionally four, two on one side, and two on the other, tying, and claying as above.

Thirdly, *Crown-grafting.*

This is performed by inserting several grafts round the crown of the stock, between the wood and the rind; and is calculated for such large stocks, as are too big and stubborn to cleave, or to perform upon large branches of apple or pear trees, particularly when intended to renew the head, or any particular branches, thereof; and is performed

ed by first cutting off the head of the stock level, then prepare the grafts by cutting one side flat, sloping an inch and half or two inches to the bottom, forming a sort of shoulder at top of the slope, and then with a wedge, proceed to open the rind of the stock, from the wood, in several places, from the top downward two inches, to admit the grafts, having previously with your knife, slit the rind down through to the wood in each place, introducing the graft flat side to the wood, thrusting it down between that and the bark, resting the shoulder of it on the crown of the stock; and thus may insert several grafts, tying them firmly and clay them well all round, and over the top of the stock an inch thick.

Fourthly, *Cheek-grafting.*

Is nearly like whip-grafting, the head of the stock being cut off and one side sloped two inches the width of the graft, sloping the graft in the same manner, with a shoulder at top, apply it to the stock, resting the shoulder on the crown of it, rind to rind at each edge, tie and clay it over.

Fifthly,

Fifthly, *Side-grafting*.

Is by inserting the grafts into the sides of branches, &c. without heading down, and practised occasionally to fill any lower vacancies in old bearing trees, or have a different variety of fruit, in any particular parts, or two sorts on the same branch.

The method is this, fix on any small branches, slope off the bark and a little of the wood, an inch and half or two inches, cut a slit downward, then cut the graft, to fit the parts, with a tongue for the slit in the branch, join it thereto, tye them close, and clay them over.

Sixthly, *Root-grafting*.

Is effected by whip grafting, upon pieces of the root of a tree, cut off from the main ones, and when grafted, planted down over the grafted part, with the graft above ground, it will strike root and grow, but this is only practised sometimes by way of experiment and curiosity.

Seventhly,

Seventhly, *Grafting by approach or inarching.*

This is only sometimes performed to any particular sort, which will not succeed by any of the other methods, or sometimes by way of curiosity, to raise a tree bearing fruit the same year, by grafting a bearing branch of the tree intended into any stock of the same kind; which is effected by having the stock and tree from which you intend to graft standing so near together, as that the branch for grafting may be brought to approach the stock, without separating it from the parent tree, or cutting off its head, nor need the head of the stock be cut off till after the junction, by process of vegetation, is effected, or may be previously cut off, if more convenient. That having the stocks either growing in the ground, or placed in pots near enough for the branches of the tree intended to approach, then, in March or April, fixing on the most commodious young pliable branch, with its head entire, bend it to the stock, and mark them in the parts where they will most readily join, and in each part pare away the bark with a small portion of the wood, of an equal width in the graft and stock, three inches long, forming a sort of tongue in the branch, and a slit in the stock to receive it, retaining the head of the branch entire, and directly
join

join the tongue into the slit, making the two rinds join exactly; bind them well together, and then properly clayed, fixing a stake in the ground, to which tie the heads of the grafts, &c. to secure them from wind.

Permit them to continue in this manner three or four months, when the parts will be perfectly cemented together, then separate the grafted branch from the parent tree by a clean cut close to the stock, and also cut off the head of the stock, if not done when grafted.

Thus, if the grafting was performed with a fruitful branch, you will probably have a new bearing tree the same year, as is sometimes practised in oranges and lemons, &c.

Future care of new grafted trees in general.

As to the future care of new grafted trees, observe in general to examine the coat of clay, with which the new grafts are guarded and if it any where cracks considerably or drops off, it must be renewed with fresh, which generally should remain till the middle or end of May or beginning of June, when the grafts will be united with the stock and exhibit a state of growth, and the clay should be taken away, and soon after let the bandages be removed.

Let the grafts shoot freely all summer in their full growth, they will often make great progress, so as to form the new tree with
toler-

tolerable heads by autumn, which, as observed in the article of whip grafting; or, that in order to have them form full heads, either the fruit trees for espaliers, walls or standards, may head down each of the new shoots in March following, to three, four or five eyes, as it shall seem proper, to force out lower collateral shoots the ensuing summer, but any kind of other trees, required to grow up tall, permit the shoots to remain entire: but observe in training those of the fruit trees, designed for espaliers and walls, to cut off all foreright growths, and extend the others in a fanned manner, either to stakes in the nursery lines, or if against any fence, nailed up thereto, and in the standards, if any irregular cross placed shoot advance, or any very long Rambler, prune them as you see necessary, to promote some regularity, suffering all the regular branches to take their natural growth.

When the grafted trees are from one, two or three, to four, five or six years old, they may be transplanted into the garden, orchard, or where they are finally to remain, and the same rule may also be observed in most other kinds of grafted trees, when the graft has produced a tolerable head of branches, to plant them where they are to remain.

Pro-

Propagation by budding.

The propagation of trees by the art of budding or inoculation, is also like grafting, a most eminent and certain method for continuing and multiplying the respective varieties of choice fruit with permanency, for the bud of a tree being a part in miniature similar to the whole plant, that inserted into a proper stock, it in process of vegetation forms a new tree, the same as its parent whence it was taken.

But budding is peculiarly calculated for some particular sorts of stone fruit, as peaches, nectarines, apricots, &c. and will also succeed occasionally with most sorts both stone and kernel fruits, and the operation consists of detaching a bud or eye from a young shoot of the tree intended in summer, taking it off with part of the bark an inch long, and inserting it into the side of the stock, stem or branch of another tree of the same family, without cutting off the head of the stock, &c. till spring after, making a slit in the bark perpendicularly to admit the buds, as hereafter explained, opening the rind on each side of the slit, for introducing the bud between the rind and wood, and which uniting therewith the same year, but remaining dormant till next spring, when the head of the stock being
cut

cut down, the buds pusheth forth vigorously each one strong shoot, two or three feet long by autumn following, commencing the new tree, which in from two or three, to four or five years, will produce fruit the same as that of its parent tree from which the buds were detached.

Thus may most sorts of choice fruit trees, and any noted variety of other tree and shrub kinds, be multiplied with great facility in abundance; since every proper bud thereof, inoculated into the eligible stocks of the same genus, or nearly related of the same class, will succeed and form a tree exactly of the same sort, both as to structure, habit of growth, flowers and fruit the same as by grafting, &c. and the sorts of fruit propagated principally by budding, as the most successful, are most of the capital stone fruits, but almost any of the kernel fruits, will also succeed; and many of the ornamental tree and shrub kinds, both of the pleasure ground, green-house and stove, likewise succeed in propagating any eminent varieties by budding; being careful to allow all the sorts proper stocks of their own respective kinds, as explained below; though some sorts as peach, nectarines and apricots succeed best budded upon a different stock, namely that of the plum.

But in most of the capital fruit tree kinds particularly, budding and grafting is a more general mode of propagating them for principal

cipal supply, than of any other tree kinds: though almost any sort may also be propagated by these methods, especially any curious variety, either in regard to foliage, flowers, or fruit, such as any fine striped or variegated leaved kinds, as in the holly and many other sorts, or any remarkable flowered variety, as in the moss provence rose, and some curious jasmynes, &c. or in others that are singular both in the beauty of their foliage, flowers, and fruit, as in the several varieties of orange and lemon, &c. so that almost any desirable variety of any curious tree or shrub kinds, not furnishing other eligible means of propagating it with certainty in its respective property, it may be effected by budding.

However, as many of our finest fruit trees are always propagated by budding as the most eligible method, we will just mention the principal sorts, which are peaches, nectarines, apricots, almonds, plums, cherries, and sometimes pears, apples, quinces, medlars, and filberts; the first six being stone fruit, the four next are of the kernel kind, and the last is of the nut tribe; for almost any kind except vines and figs, will succeed by budding: but of the fruit-tree kinds, the peach, nectarine, apricots, and almond are mostly always propagated by budding as the most prosperous method; plums likewise are very commonly raised by budding with best success; and cherries and pears suc-

succeed almost equally well by budding and grafting, whereby if any of them, both plums, cherries, pears, &c. that are budded in summer should fail, they may be grafted in the spring following, for most sorts of fruit trees which succeed by grafting, will also take by budding, and for experiment may try any sort required: though some sorts, such as the peach, nectarine, and apricot, &c. are more successful by budding than grafting.

As to the proper stocks upon which to perform the budding of the different fruits and other trees, they must be young trees, either of the same genus, or nearly related, as observed of those for grafting, and raised either from seed, suckers, layers, &c. and when from about a quarter or half an inch, to an inch thick, are of proper size for budding. Observe the sorts as below.

The peach, nectarine, almond and apricot, succeed both upon seedling stocks of their own kinds respectively, and upon one another, and upon the plum, the last of which is the most generally used as the most successful; for the plum being hardier and more suitable to different soils, as well as the most durable, should always be preferred as the chief stock for the above kinds: which although of a different genus from the peach, nectarine, and almond; is very nearly related of the same class, so as they all grow remarkably prosperous upon this stock: and the apricot be-

ing a species of *Prunus* or plum, consequently succeed well on the plum stock; and the peach and nectarine, though they grow freely on all plum stocks, yet are often improved, and more healthy and durable on the muscle plum: all of which stocks are raised from the stones of their respective fruits, the plum also by suckers from the root, and layers of the young branches; and that if for any choice variety of peaches, it is required to have the muscle plum stock of its true nature, it must be obtained either by root suckers of that tree on its own roots, or those from the peach tree, &c. worked upon such stocks, or the layers of the muscle tree branches: as the seedling raised stocks thereof, vary to different sorts; however, in default of this sort, those of any variety will succeed.

For plums and cherries, each must have stocks of their own kinds for general use, raised from the stones of the fruit, and the plum also by suckers; or for variety they may be budded upon stocks of each other, or upon that of the apricot, or all these sorts may be budded on the same tree, just for curiosity, as being species of the same genus (*Prunus*.)

And the pear and medlar succeed upon their own stocks, and upon one another, and pears also on quinces, as observed in the list of stocks for grafting.

The

The methods of raising all the different stocks for budding, is exactly as directed in raising fruit trees, and fruit tree stocks from seed, and in raising the stocks for grafting, both by seed, layers and cuttings, as there directed: and when they are from a quarter or half an inch to an inch thick, as before observed, are of proper size for budding; which to form dwarfs for common wall and espalier trees, will be eligible for budding, when only two or three feet high, as, for which trees the bud is always inserted within from six or eight to ten or twelve inches of the bottom, to obtain a supply of lower shoots from the beginning, to form a full spread of branches arising from within a little of the ground, covering the whole wall and espaliers regularly from bottom to top; but for half and full standard wall trees, and common detached standards, must train the stocks with from three or four, to five or six feet stems or more, for the budding to be performed near the top; or at three, four or five feet for half, and six or seven feet for full standards, the stock forming the stem.

Budding may also be performed occasionally upon bearing trees; when designed either to renew the head or any particular branches, change the variety of fruit, or have two or more sorts on the same tree, as observed in grafting, performing it on the young wood,

either of the same year, or that of from one to two or three years old or more.

There is principally but one general method of budding or inoculating, and the operation is performed always in summer, principally in July, and from the beginning to the middle of August, when the shoots of the year are of a proper growth to afford eligible buds with which to effect the inoculation; as also that both the rind of the stock, and that of the cuttings of the shoots from which the buds are to be detached will readily run or separate from the wood; for the buds, consisting each of a single eye, with a small portion of the rind, are always taken from the young shoots of the year only, each shoot being furnished with several eyes, having a leaf at each; and each eye forms a bud for budding, being cut off an inch or more long, with the rind and part of the wood adhering; but the woody part afterwards stripped off, then inserted into a slit in the side of the stock, between the rind and wood, at a proper height either for dwarf standards, or half standards. See the particular method as hereafter, p. 248.

But previous to the operation of budding, observe of those fruit trees intended for walls, that as peach, nectarines, and apricots, require mostly to be trained against walls, &c. to obtain their fruit in perfection, they must principally be budded in low
stocks,

stocks, near the ground, to form common dwarf wall trees, so as their branches coming out low at first, may cover the whole wall from the bottom upwards; or for high walls, may bud them for half and full standard wall-trees in tall stocks, of from three or four, to five or six feet stems, in order for their head of branches to cover the upper part, while the dwarf trees cover the lower, and advance sufficiently to occupy the wall upward; then the half standards, &c. pruned away by degrees, observing the same of plums, cherries, pears, &c. both in respect to common dwarf wall-trees, and half and full standards for walls; but these sorts will also succeed well in common detached standards, in the open quarters of the garden and orchard: some apricots will also succeed in detached standards, particularly the Brusefsels and Breda apricot.

However the general rule to be observed is, that in budding, to have common detached standards, either in fruit trees, or ornamental trees and shrubs, it must generally be performed on tall stocks, at five, six, or seven feet height, or three, four, or five feet for detached half-standards; and for dwarf or quarter standards, the budding must be performed on low stocks, of one or two feet of clear stem, inserting the bud at that height, or for any kind of the above sorts of standards, may also bud occasionally in low stocks,

inserting the bud at half a foot or a foot above ground; and the main shoot produced from the budding, trained for a stem the height required, though the budding for standards, upon stocks already formed of the proper height, is the most eligible for general practice.

But for any kinds of forest trees designed for timber, both the budding and grafting should generally be performed on low stocks, and the bud inserted within, from two or three, to four, five, or six inches of the bottom, in order to obtain the whole stem of the sort of wood intended.

Performing the operation.

Thus far observed, proceed to perform the operation any time from about the middle of July to the middle of August; when having recourse to the trees you intend to bud from, and cut off a quantity of the shoots of the year, from which to take the buds for insertion; being careful to chuse moderately strong shoots all of the same years production, cutting off a few at a time as wanted, and cut off the leaves, all to about a quarter or half an inch of the footstalk of each remaining to the eye of the buds; and having a proper budding knife, the haft of which being flat to assist in the insertion of the bud, as hereafter explained,

plained, together with some new bafs mat for tying the buds close after insertion.

Thus having every thing, as above, ready for the operation, clear the stock from lateral shoots, leaving the head on entire for the present, and prepare to insert one bud in each stock; fixing on a smooth part, at the proper height for dwarfs or half and full standards as before explained, and with the knife make a transverse or cross incision into the bark of the stock, quite through to the firm wood; and from this, cut another slit perpendicularly, downward, an inch and an half, also quite through the rind, both cuts together forming this figure T: which done, then having the cuttings of the young shoots furnishing the buds above explained ready, take off a bud from the shoot intended, by entering the knife half an inch below an eye, with a slanting cut half way into the wood, bringing it out clean near an inch above the same bud; detaching it with part of the wood, and directly with the point of the knife and thumb slip off the woody part thereof clean to the rind, minding whether the gem or eye of the bud remains: if a little hole appears it is gone, and another bud must be prepared, which being effected, then placing it with the back part between your lips, till with the flat haft of the knife you separate the rind of the stock from the wood, on each side of the

perpendicular cut, and then with all expedition introduce the bud at top, slipping it down between the wood and rind to the bottom of the aforesaid perpendicular incision, with the eye and remaining part of the foot-stalk of the leaf exactly in the opening of the slit, making the top of the bud join in even with the horizontal incision above; by cutting off any part that may be too long, closing the bark upon the bud, and instantly let the parts be tied close with a flat ligature of bals moistened in water to render it pliable and stronger; beginning a little below the place of insertion, and continue it upwards closely round the stock and bud together, leaving only the eye thereof clear, so carrying it above the cross cut, tie it securely; which finishes the operation, no clay being required as in grafting.

In about three weeks or a month at farthest, the successful buds will have effected their junction with the stock, appearing fresh and plump, and the parts swelled; when let the bandages be loosened, to give full scope of growth to the bud; which however will not shoot the same year, but remain dormant until next spring, as before observed, then will begin to push; and at which period, the head of the stock must be cut off just above the bud's insertion, and the shoot produced from the bud forms the new head.

There-

Therefore next spring, about February or March, just as the trees discover an effort for shooting, let the head of the stock be cut off sloping, either close behind the top of the bud, or about three or four inches above, according to the old practice, which part serving whereto to fasten the first shoot proceeding from the bud, but must be cut down close the spring following: and in either method of heading the stocks, the nourishment destined for the supply of the head, being after this directed almost wholly to the buds, they will push with vigour, each one strong shoot, permitting it to extend in length all summer; but displace all other shoots from the stock, thereby directing its whole efforts to the bud-shoot, it will advance rapidly two or three feet long, or more the same year, forming the new tree, proper for final transplanting into the garden, &c. the following autumn, winter, or spring; or may remain longer in the nursery, and trained in the order intended, either as wall, espalier, or standard trees, till from two or three, till five or six years, as shall be expedient, according as wanted either for private use, or public supply.

But it must be observed, preparatory to the order of training fruit trees particularly, that whether the young budded trees are transplanted into the garden at a year old, or remain longer in the nursery, and that if for common

wall trees, they must have the first shoot from the bud, headed down to a few eyes in the spring, when only one year old from the budding, to force out some strong lateral bottom shoots, as a basis to form a full and spreading head quite from the beginning; otherwise the bud shoot would run up naked like a stem, leaving the lower part of the head destitute of branches, which in wall and espalier trees particularly, would be attended with a great disadvantage.

Though as sometimes the first shoot immediately from the bud, advances with considerable strength the first summer, producing many collateral shoots upward, forming a bushy head three feet high or more by autumn, many persons are unwilling to have them cut down: but as the lower part is generally naked, and the shoots produced above, often slender, weak, and imperfect, unfit to train or retain, either as wood branches to furnish others to form the head, or for immediate bearers, so that it is of the utmost importance to procure several strong shoots from near the bottom, by means of heading down the first main leader in its yearling growth.

Therefore it is always adviseable in budded fruit trees, for walls and espaliers particularly, to cut down the said first shoot or head at a year old, in the spring after it is produced; and the proper time is about the

the latter end of February or beginning of March ; when with a sharp knife cut the head clean off, slanting to within five, six, or eight eyes of its origin, and it will produce so many strong collaterals the same year, thereby form a proper set of branches from the beginning, to furnish all the other branches upward ; and for wall and espalier trees in particular, these first collaterals thus obtained, will also sometimes require pruning short, to six or eight eyes, &c. either early the same summer they are produced by pinching or pruning off the tops early in June, or in winter or spring following, to procure more effectually a further supply of lower branches to cover the wall and espalier equally quite from the bottom ; and of which displace fore right and other irregular shoots, and train in the others to the wall or to stakes, &c. at full length : and of the standards, cut out close any cross placed shoots, and reduce within bounds any long ramblers, and leaving all the regular branches entire, and permitted to extend in their natural growth.

But it should be observed of such of the new budded trees designed as standards, in which the budding was performed low in the stock, and the main shoot is intended to be trained for a stem, it must not be headed down, as above advised for general practice, in common wall and espalier fruit trees,

trees, but permitted to run, till advanced to the proper height, for full or half standards, either for fruit or any other tree kinds, clearing it from collateral or side shoots; and when at the height intended either of three, four, five, or six feet, those of the fruit tree kinds may be lopped or pruned off, where you would wish it to emit shoots for branches to form the head; but if standard forest or ornamental trees, generally permit the top to remain entire, and advance in its natural growth.

The same method may be practised in orange, lemons, or other green house plants propagated by budding or inoculation; as likewise any of the hot-house kinds, in the same mode of propagation.

Propagation by Spawn.

Spawn, in the vegetable kingdom, is generally considered as an offspring or production of the root of certain vegetables; which, in some sorts, as in the mushroom tribe, particularly, consists of numerous white stringy fibres, running and spreading under the soil in lumps of dry rotten dung and earth, producing a multitude of minute white knobs, embryo mushrooms, that gradually increase in size to perfect mushroom plants: sometimes issuing from under the earth like small

white buttons; others near half grown; and some, previously accomplishing much of their growth within the surface, suddenly make their eruption from the earth, half, or nearly full-grown; frequently appearing in the morning fit to gather for use, where they were not visible the preceding day: and in some other vegetables, spawn is sometimes applicable to small suckers, rising numerously in a thicket from the roots of certain plants, as lilac, codlin-tree, &c. and many of the herbaceous tribe.

But generally in gardening, the article spawn is principally considered as alluding to the production and propagation of mushrooms; there being no other good practical method, by which this plant can be propagated with certainty and due abundance; as it produces no visible seed that can be procured for sowing, nor any other kind of off-sets, suckers, &c. for propagation, than the aforementioned spawny substance, proceeding apparently, either from the root of the plants or the invisible seed, in the form of many white thready shoots or fibres, running and spreading in lumps of dry rotten dung and earth, as before intimated, imparting a strong mushroom-like smell; which indicates, that it is of the true and only wholesome kind of mushroom, there being many spurious and pernicious species and varieties, especially among those rising spontaneously in pastures, &c. and therefore the garden mushroom,

mushroom, produced by the process of regular cultivation in mushroom beds, is always greatly to be preferred for the certainty of its being the true salutiferous sort; and which may be propagated and obtained plentifully by planting the lumps of spawnny dung or earth, into a sort of hot-bed made with fresh horse-stable dung, made in the shape of the roof of an house; and the spawn being inserted into the sloping sides, it runs and propagates exceedingly, producing numerous mushrooms in six weeks or two months, as fully explained hereafter.

This spawn of the mushroom is by some contended to originate principally from the putrefaction of earth or dung, supposing the mushroom neither produces flower nor seed for the propagation of its species. Others of better experience, consider the mushroom as productive both of flower and seed; but that from their exceeding minuteness and obscurity, remain still invisible; and that in many instances they consider the plants to originate from the production of this invisible seed, disseminated by the air, &c. or some unknown effect of nature, to soils and situations adapted to the temperature of the plant, as we may often observe mushrooms produced naturally, both in pasture-fields, dung-hills, old hot-beds, &c. where neither any spawn was planted, nor mushrooms known to have grown before; and these consequently

requently are apparently, rather the productions of some previous seed, than the entire effects of putrefaction of the earth and dung, &c. in which they are produced, though dung-heaps, or dung-composts, &c. arrived to a state of decay and putrefaction, and not very wet and buttery, but of a somewhat dry rotted state, are the most favourable soils for promoting a natural production of mushroom-spawn, originating either from some particles of former spawn, or disseminated seed of the mushroom.

But the doctrine of the spawn owing its origin entirely to putrefaction of the dung and earth, is now pretty generally confuted by the modern naturalists in botany: and they consider the mushroom as a true and perfect plant, producing both flower and seed like other vegetables; but from its minuteness and concealed situation, as before observed, still remains undiscovered, and is only supposed to be contained, either between the *lamellæ*, or gills underneath, or in small cavities dispersed over the surface of the plant; and that, when the mushroom arrives to full growth, the head forming a large flap, explicating itself almost flat, the supposed seed being then probably in perfection, is disseminated far and near; and falling on certain soils and situations, it germinates in the earth or dung, shoots forth into many fibrous strings, forming the spawn for the production of

of the future mushrooms; and which spawn, besides its production of a crop of mushrooms, it, at the same time increases exceedingly, spreading every way, furnishes a manifold fresh supply of spawn to plant for the production of future crops.

For the propagation and production of mushrooms, by the process of regular cultivation in gardens, &c. is effected by planting lumps of the spawnny earth or dung, into a sort of hot-bed, as before intimated, made of fresh horse-stable dung, in a long ridge the shape of the roof of an house, and in a fortnight or three weeks after, when reduced to a very moderate warmth, planting the spawn into the sides thereof, then earthed over one or two inches, and the whole covered with clean dry straw, &c. a foot thick; as more fully explained below.

Thus observing, in the propagation of mushrooms, that as spawn is the only material by which the plants can be propagated or raised by the process of art, as before suggested; when therefore, it is intended to propagate and raise a crop of mushrooms, proceed in the first place to collect, in the proper places, a due quantity of spawn, either in old horse-dung heaps, old hot-beds, dungy composts, or pasture-fields, &c. in all of which, is found in dry lumps of dung or earth; but principally most abundant in horse-stable dung, that is half rotted and moderately

moderately dry; this kind of dung is more adapted to its nature than almost any other soil, though it often occurs in very different soils and manures, &c. and the best season of its perfection and plenty, is the autumn, about July, August, September, and October.

In the proper season, as above, search for the spawn both in old dung 'hot-beds, old dry dung-hills, towards the outsides; also in the stable-yards in dry bye corners; and in horse-rides, under cover, where they exercise horses, searching in the dung and litter next the sides; likewise in all horse-mill tracts; and in all places where horse dung has lain any considerable time; or in dungy compost heaps of dung and other soil together; and in default of better, have recourse to pasture-fields, where good mushrooms have been observed to rise naturally: and in all of which, the spawn, as before described, appearing in lumps of dung or earth, let the lumps, or cakes thereof, be taken up entire, the dung, or earth and spawn together; and the whole deposited in some shed or other apartment, in the dry, and covered over with litter from the wind and air, till the bed is made and ready for its reception, or if the lumps of spawn are wet, previously spread them to dry, then deposited as above, it will keep good several months, if required.

Then, being furnished with a due supply of spawn, as above, prepare for making the mushroom-

room-bed, a good quantity of the best fresh warm stable-dung, consisting of the long wet litter, short stuff, and horse droppings together, as cleared out of the stables; casting the whole in a heap, to remain a fortnight or more to promote a regular fermentation, and equal temperature of heat; forking it over once or twice at a week's interval, to mix the whole equally, and give vent for the burning quality and noxious steam to evaporate more freely, and thereby reduce the mass to a more moderate and equal warmth, not so liable to burn when formed into a bed, and render the bed sooner fit for spawning, than if it was not thus previously prepared; which is particularly necessary in the cultivation of mushrooms, as the spawn requires only a very temperate warmth, being of an exceeding delicate nature, impatient both of too much heat, cold, and moisture; all of which would soon destroy its vegetative faculty.

The dung being thus prepared for making the bed, generally chuse some dry sheltered situation, in the full sun, whereon to make it; both to have all possible benefit of the sun's influence to preserve its proper temperature longer in perfection, and more effectually to dry the covering of the bed after excessive rains and snow; and is also adviseable to have it made on a somewhat elevated spot, and entirely on level ground, both that it may be more out of the wet, and to have the opportunity of spawning quite to the bottom,

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which could not be so readily effected, if made some part thereof in a trench; though as sometimes practised, especially when making extensive beds, and more particularly when designed to make them in some of the kitchen ground quarters, where the earth is good, in order to have the excavated earth of the trench ready at hand, wherewith to mould over the bed, digging the trench shallow, only six or eight inches deep, laying the earth to each side ready for use when the bed is made, to save the trouble of bringing some from a distant part of the garden; and as to dimensions of the bed, observing, as before intimated, to mark it out four or five feet wide at bottom, by from ten, fifteen, or twenty to fifty feet long, or more, according to the supply of mushrooms required, either for private use, or for sale in the markets, &c.

Then begin the bed by shaking some of the longest strawey dung in the bottom, half a foot thick; afterwards take it long and short as it comes to hand, working up the bed therewith, firm and equally in every part, beating it well down with the dung-fork from time to time, as the dung is added, gradually drawing in both sides in a sloping manner till brought to meet in a narrow ridge at top, four feet at least perpendicular height, sloping both ends in the same proportion, thereby forming the bed with two steep sloping sides, &c. like the shape of the roof of a house, as formerly observed; which
form

form being both better adapted to produce a moderate temperature of heat, shoot off the wet to preserve the spawn dry, as well as afford a more capacious surface to spawn in, and yield a larger crop of mushrooms, than if carried up square like a common hot-bed, with only the top surface to yield the produce; for a mushroom-bed is not designed to be defended with garden frames or glasses, only a thick covering of litter: and the spawn is to be planted into both the sloping sides, and each end quite from bottom to top, in every part; not, however, till a fortnight or three weeks after it is made, or till the vehement heat of the bed is past and reduced to a very gentle warmth; for the least violent heat would constantly destroy the spawn, so must be particularly careful not to spawn the bed while the heat is any wise violent.

Therefore, as a more certain direction for spawning, observe, as soon as the bed is made, to thrust down two or three long sharp-pointed sticks half a yard into the bed, and by drawing them up every day or two, and feeling the lower end, you readily judge of the increase and decrease of the heat; which, as it will be very vehement the first week or fortnight, you must be sure to permit it to be considerably abated, and reduced to a very moderate temperature, before you venture to plant the spawn: so that in a fortnight, or three or four weeks, or more, or less, according to the substance in length,

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&c. and degree of fermentation of the bed, the great heat will begin to subside, and gradually decrease to a moderate state of heat; and when become of a quite mild growing warmth, let the spawn be brought forth, the large lumps broken into smaller, and planted in rows along each side of the bed.

The spawning is performed generally either by inserting the lumps of spawn into the dung, just within the surface, in rows, six or eight inches asunder, and five or six inches apart in the row; then smooth down the dung and spawn with the back of a spade, and earth both sides, ends, and top of the bed all over with light rich mold two inches thick, smoothing it also down evenly with the spade: or before you put in the spawn, earth the bed all over, two inches thick, insert the lumps of spawn into the earth, in rows, the distance as above, covering the whole with more mold, an inch thick, and smooth it evenly down, as just directed: or lay spawn immediately upon the surface of the dung, in layers, adding a hand's-breadth of earth along the bottom; so placing the first layer of spawn upon the dung, resting the lumps upon the upper edge of the earth, then earth over the spawn one or two inches deep; add another layer of spawn, and earth it over in the same manner, and so on to the top of the bed on each side and ends; observing in either method of spawning, in applying the covering of earth, to beat it up lightly with
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the back of the spade from time to time as you advance, both to fix it properly in a regular manner, and to smooth the surface even that no wet or redundant moisture, after excessive rains, may lodge on the sides and perish the spawn.

Then, after having thus spawned the bed, the next care is to prepare to defend it from the weather, with a thick covering of dry long litter or clean straw; but this should not generally be fully applied immediately after spawning, at least not more than five or six inches thick at first; or not at all, if there is any apprehension of a renewal of too much heat, especially in very substantial beds of considerable length, lest the close covering occasions danger from after-heat; for after a bed is spawned and closely earthed over, the casing of earth, by confining the internal heat and steam, and excluding the outward air, generally promotes a renewal of the heat in a smaller or greater degree; and, that if also covered with litter, it might cause the heat to increase too violent; and, therefore, if at this juncture, any renewal of much heat is discovered, no general covering of litter must be yet applied; nor probably for a week or fortnight, or more, if a very strong bed: only if heavy rains, &c. should fall, throw a quantity of litter at top, or spread large thick garden mats over to shoot off the wet: observing, however, generally to keep the

trying-sticks thrust down into the upper part of the bed, and drawing them up daily to feel the lower end, you will more readily determine the temperature of the heat; and when it discovers a quite moderate steady warmth, then apply the covering of litter, &c. in due time.

The litter, for covering, may either be clean dry wheat or other straw, or any quite dry, long stable-litter, &c. laying it only about half a foot thick at first, encreasing it by degrees to double that thickness, or more, sufficient to defend the bed from great rains and snow, &c. and it will be also adviseable in bad weather, and all winter, to spread some large garden-mats over the covering of litter, the more effectually to throw off the wet, which must be always particularly guarded against to prevent its penetrating through to the bed, as much moisture would either totally perish the spawn, or greatly retard its vegetation and production: but being well protected by proper covering, as above, from the full air, wet and cold, &c. the kindly warmth of the bed will soon set the spawn in motion, so as it will run and spread all over the surface of the dung and earth, knot abundantly, and begin to produce mushrooms plentifully in a month or six weeks.

Continue the covering constantly over the bed night and day, generally augmenting its thickness in winter, having particular care

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that it is of sufficient thickness to defend the bed from great rains and snow; and after which, be careful to examine if the wet has any where penetrated quite through to the bed; or that the covering is rendered considerably wet; and in which case, let it be removed as soon as possible, turning it off lightly with a pitch-fork in a dry time of the day, removing the wet litter next the bed quite away, and directly apply dry straw in its place, adding the driest of the other litter over this, and let the rest be previously dried as well as possible, for the same purpose.

As to the produce, if the bed is well managed in its different stages as we have advised, the moderate kindly warmth of the dung will soon promote a lively vegetation in the spawn, and it will propagate exceedingly, shooting out every way into numerous fibres, running and knotting all over the earth and dung, as before hinted, forming numerous buds or minute knots, which gradually encrease in size to proper mushrooms, fit to gather abundantly in, from about three, four, five, or six weeks, to two or three months after the bed is spawned, &c. according to the temperature of the bed and nature of the spawn; for some beds will produce mushrooms in three or four weeks after spawning; others will be, sometimes, so many months; they generally rising in numerous clusters all over the

the surface of the earth of the bed, in different stages of growth; and when from the size of buttons, till they are half and full grown, are proper to be gathered for use; but not generally permitting any to remain to become large flaps, unless when they are particularly wanted of that state; because, when of that large growth, they would injure the adjoining young plants that are advancing below in successive order; for a bed continues producing them in succession and great abundance six or eight weeks, or several months, affording a gathering twice or thrice a week, when in full production; afterwards, will become gradually less considerable, probably not above once a week or fortnight.

Begin to examine, for gathering, generally in three weeks or a month after the bed is spawned, chusing dry weather; and with a pitch-fork turn off the litter on one side first, especially when a cold cutting air; and gather all those that are above the size of ordinary round buttons, or of half, or near full growth, as before observed; detaching them with a gentle twist of the hand, taking them clean up, head, stalk and root-part together, not cutting them off with a knife, leaving the stump remaining, which would rot and breed maggots, to the detriment of the succession plants; being, however, careful in gathering, not to disturb the knotted clusters of embryo plants, and other larger successional ones,

advancing just within and above the surface of the earth, one under another; and at each gathering, generally clear off all that are fit, of the sizes above-mentioned: and as soon as done gathering, directly cover the bed again with the litter, &c.

Sometimes a bed works unkindly, and the spawn is slow of vegetation, probably not productive of mushrooms in the time they might have been reasonably expected; in which case, examine the state of the bed and spawn; if the dung has not been burned by too much heat, nor is much decayed, or become very rotten, and that the spawn appears in a good vegetable state, and smells well of the mushroom, do not disturb the bed; for a bed, sometimes, after remaining inactive several months, will become fertile and produce tolerable good crops; especially if timeously assisted by a little additional heat, by applying a quantity of warm long horse-litter; therefore, in six weeks or two months after spawning, if the bed, &c. appears inactive, endeavour to enliven the warmth; previously removing the covering of straw, &c. then having a good quantity of dry warm horse-litter, shake it over the bed a foot thick at least, laying some of the other covering and mats over all; and this will both renew the warmth of the bed, and promote a free vegetation in the spawn, often productive of a good crop of mushrooms.

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Likewise, when a bed, not worn out, or decayed, has considerably declined its vegetative warmth, it will be of much advantage to apply warm dry horse-litter, as above, a good thickness, it will revive the declined heat, thereby renew the vegetation of the spawn, and it will afford a quicker and more abundant production in proportion.

Thus far is the principal practice necessary to be observed in the work of propagation by spawn, in the production of mushrooms; which are the only plants that can be raised by that method of propagation.

When the bed has done yielding its produce, the dung thereof is excellent manure, and also furnishes portions of good spawn for propagation to plant in future beds; being careful, therefore, in demolishing the old beds to collect all the lumps of good fresh spawn that occur, and deposit them in a dry place, and covered with litter or mats, as before advised, to preserve it for use.

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BOTANICAL ARRANGEMENTS
OF THE
VEGETABLE KINGDOM:

Comprising all the
GENERA, SPECIES AND VARIETIES OF PLANTS,
PROPER FOR PROPAGATION,

IN ALL
DEPARTMENTS OF GARDENING;

BY THE
VARIOUS PRACTICAL METHODS DIRECTED AND
EXPLAINED IN THE FOREGOING WORK.

Being a Complete Register, in Alphabetical Order, under different Heads or Division, of all the Species and Varieties of Plants, Trees, &c. proper for general Propagation and Culture, scientifically arranged in their respective Genera or Families, and each Family or Genus registered under its Botanical Latin Name, followed by that in English; as also the Latin trivial and English Names of all the Species in each Genus, with the Names of the Varieties of the respective Species.

The whole according to the
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The following arrangements are comprised in eight divisions, according to the nature, temperature, and respective uses in gardening, &c. of the different orders of plants that compose each division; comprehending

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| I. KITCHEN - GARDEN PLANTS. | V. ANNUAL FLOWER PLANTS. |
| II. FRUIT TREES. | VI. GREEN - HOUSE PLANTS. |
| III. FORREST and hardy ornamental TREES and SHRUBS. | VII. HOT - HOUSE PLANTS. |
| IV. Hardy HERBACEOUS, PERENNIALS, and BIENNIALS. | VIII. FIELD PLANTS; and for the general improvement of LAND. |

And in each division the plants are all systematically arranged in their botanic families or genera; a genus or family being an assemblage of several species, or consisting of from one, two, or three, to many individual plants in each genus, all bearing the same invariable mark of distinction, drawn from the most essential parts, i. e. all the parts of the flower or fructification, as being the most comprehensive, important, determinate, and constant; and all plants exactly similar in all the different parts of the fructification or flower, are relations or species of the same family or genus; and by the laws of botany, they, like the children of a family, all bear one generical, botanic name, of the

respective genus to which they belong; though each species or individual plant of the different genera, is at the same time distinguished by a particular trivial or specific name, added to that of the genera; and as some species are sportive in varieties, they are arranged in the English column, immediately after, and by the name of the parent species, joined to that of their proper distinctive names, and always in Italics.

Generally plants that are of the same genus, often possess the like medical powers and œconomical properties; as for example, the genus *Allium* comprehends the garlick, onion, leek, cives, shalots, &c. and the genus *Artemisia* comprise the mugwort, wormwood, southernwood, &c. and so of many other genera.

In the different arrangements, the names of the genera are distinguished by small-capital letters, both in the Latin and English, opposite to one another in their respective columns; the species of each genus by Italic in the Latin trivial names, and by Roman letters in the English; and the varieties, where any, of particular species, are all in Italic letters in the English column only, as above remarked: and as many species occur, which formerly constituted distinct genera in ancient botany, but by modern improvements in that science, they are reduced to species only, of the particular genera under which the

they now appear; still, however, mostly retaining their former generic name for that of the trivial, distinguished from the common trivial names, by being mostly in Roman letter; or at least, beginning with a capital: and as many of those species, thus distinguished, are more generally known by their former generical name; as for instance the *Auricula*, formerly a genus, but now a species only of *Primula* [*Primula Auricula*;] the *Laburnum*, rendered a species of *Cytisus*, is [*Cytisus Laburnum*,] and the *Alaternus* is now a species of *Frangula* [*Frangula Alaternus*:] they are therefore, also, mostly farther distinguished by a repeated insertion of their respective specific name within a [] in the column of the English names.

We have also endeavoured to English the Linnæan and other Botanic Latin trivials, or specific names of the species, &c. which are exceedingly various; either consisting frequently of a sort of specific distinction, often expressive of the particular sorts of roots, stems, branches, &c. and of their nature or order of growth, as upright-growing, trailing, ascending, climbing; or round-stalked, square-stalked, triangular, &c. and often the different sorts of leaves, as *rotundifolia* or round-leaved; *cordifolia* or heart-leaved; and so of the various other parts of the plants, flowers, and fruit; and colours of the flowers, &c. and sometimes also the specific names imply

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the properties and uses of the plants, as in *Rubia tinctoria*, Dyer's madder; also often the places of their growth; or the countries of which they are natives, &c. and numerous other particulars.

For farther particulars in the descriptions of the botanical arrangements, see the descriptions of the classes, orders, genera, and species, &c. in the Appendix.

FIRST

FIRST DIVISION.

A R R A N G E M E N T

O F T H E

KITCHEN-GARDEN PLANTS.

THE plants of this division consist principally of the herbaceous tribe, and some few under shrubby kinds; and as they consist both of annuals or one year plants, biennials or two year plants; and of perennials or plants of many years continuance, the following letters placed after the names of each of the respective species in each genus distinguishes their duration, viz,

a. Annuals.*p.* Perennials.*b.* Biennials.*sb.* Shrubby.

Note, Annuals as the name imports, are only of one year's duration, and propagated principally only by seed sowed annually; and that being sowed in the spring or early
part.

part of summer, the plants both attain perfection for use the same year, in summer and autumn, and soon after produce seed, and then totally perish, top and root the same season, before winter; as in lettuce, spinach, pea, bean, kidney-bean, radish, turnep, and many others: but when sowed late in summer or in autumn, many sorts will stand over the winter, till next spring, and early part of summer, then attain perfection for use, produce seed and decay, all within the space of a year from the time of sowing; so that all the annual tribe must be raised every year from seed, principally in the spring season for the main crops, and afterwards, once a month, or six weeks, all summer, till autumn, for successional supplies; and some sorts require sowing once a week, or fortnight; such, particularly, as small fallading.

Biennials are plants of two years duration, and principally always propagated only by seed, sowed every year; and that being sowed in spring or early part of summer, they arrive to perfection for use mostly the same year in summer and autumn; but do not shoot up for seed till the second year, that is the year following; as in cabbage, carrot, parsnep, onion, leek, &c. and when they have produced seed, they also like the annuals, wholly decay, top and root: and therefore fresh supplies must be raised every year from seed, principally in spring for the main crops, and occasionally smaller
sow-

sowings, of some particular sorts, in summer and autumn, both for successive crops, and to have them young when required for particular occasions.

Perennials are such that are of many years duration by the root, but the tops or stems generally decay in autumn or winter, and new ones shoots up from the root in spring: and they propagate various ways, some both by seed and by off-sets, slips, suckers, &c. others principally only by the latter methods, and rarely by seed; and that when once raised by either methods of propagation, they in most sorts remain durable in the same root for many years, yielding their produce annually in summer, according to their nature of growth; and at the same time, multiply their species abundantly; some by suckers, off-sets, slips, cloves, and spawn of the root, as in artichokes, horseradish, balm, mint, cives, garlick and mushrooms; and in some the same individual root being only of one year's duration, it perpetuates its species from year to year, by a plentiful annual progeny of root off-sets, as in the potatoe and Jerusalem artichoke, both of which propagate both by planting the roots whole, and by cutting them into several pieces, each making a set to plant; and the potatoe also is occasionally propagated by seed, when designed to try to obtain new varieties: some other perennial esculents, propagate both by slips
and

and cuttings of the root and stem, &c. as in mint, &c. others again of the perennial tribe, are propagated only by seed, as is the case in asparagus; which, however, when once thus raised, the same plants assume a perennial state in the root, continuing in perfection many years, and produce plentiful crops annually, in their proper season.

Undershrubby and shrubby plants of this division, are such that are perennial both in root, stem and branches wholly, of several years duration; and the distinction between the under shrubby and shrub kinds, is, the former are commonly of low slender growth, somewhat between an herbaceous and woody nature, such as sage, hyssop, thyme, &c. and the perfect shrub kinds, grow large and assume a firm woody texture in their stem and branches, as in rue, rosemary, &c.

As the following arrangement of the kitchen garden plants consists of annuals, biennials, perennials, and some species that are both biennial and perennial, they are distinguished by the marks before explained.

AGARICUS

— *campestris*

MUSHROOM

Field agaricus, or common mushroom *a.b.p.*

Varieties

— True red-gilled whole-some mushroom

— White or yellow-gilled, spurious and pernicious mushroom — is mentioned only to distinguish it from the other, and to avoid using it.

ALLIUM

GARLICK, Onion, Leek, &c.

1 *Allium sativum*

Cultivated or common garlick *p.*

2 — *Scorodoprasum*

[*Scorodoprasum*] or rocambole *p.*

3 — *Cepa*

[*Cepa*] or onion *b.*

— Common Straßburgh onion

— White Spanish onion

— Red Spanish onion

— Portugal onion

— Silver skinned onion

— Large Reading onion

— Blood-red onion

4 — *cambrica* (*ascaloni*)

Welch onion, scallion, or ciboule *a.b.p.*

5 — *Schoenoprasum*

[*Schoenoprasum*] Cives, or minor perennial onion *p.*

6 — *Afcalonicum*

[*Afcalonicum*] Afchalot or shallot *p.*

7 — Por-

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- 7 — Porrum [Porrum] or leek *l.*
 — broad-leaved London leek
 — narrow-leaved Fr. leek
- ANETHUM
 1 Anethum graveolens [Strong smelling anethum,]
 or common dill *a.*
 2 — Fœniculum [Fœniculum] or fennel *b.p.*
 — Common fennel
 — Dark-green leaved
 — Long-spaced leaved
 — Sweet fennel
- 3 — Fœn. azoricum Azorian dwarf fennel, or
 Finocchio
- ANGELICA
 — Archangelica [Archan.] or cultivated com-
 mon garden angelica *b.p.*
- ANTHEMIS
 — nobilis
- APIUM
 1 Apium Petroselinum [Petroselinum] or parsley *b.*
 — Common plane-leaved
 parsley
 — Curled-leaved parsley
 — Large-rooted Hamburg
 parsley, for its roots to boil
 like carrots, &c.
- 2 Apium dulce Sweet apium, or celery *a.b.*
 — Common upright Italian
 celery
 — Solid-stalked upright
 celery
 — Giant upright celery
 — Turnep-rooted dwarf
 celery, or celeriac
 (Asparagus) erroneously
 called Sparagras
- ASPARAGUS
 — altilis Cultivated asparagus *p.*
 — Battersea asparagus

ARTE.

- Gravescend asparagus
 ———Dutch asparagus
 ———Deptford asparagus
 ———Large Reading asparagus
 Note, These are one and the same sort, but only improved by culture in different places, as above
 (MUGWORT) Tarragon
 [Dracunculus] dragon herb, or tarragon p.
 ARTEMISIA
 ———Dracunculus
 ATRIPLEX
 ———hortensis
 CRACH
 Garden crach a.
 ———Green-leaved
 ———Red-leaved, or Red Spinach
 BETA
 BEET
 1 ———vulgaris Common garden beet b.
 2 ———rubra ———Red beet, long-rooted
 ———Round or turnep-rooted
 3 ———Cicla [Cicla officinarum] or Official White Beet
 ———Common green beet
 BORAGO
 BORAGE
 ———officinalis Official or common Borage a.
 ———Blue-flowered
 ———White-flowered
 BRASSICA
 CABBAGE, Savoy, Borecole, Colewort, Broccoli, Cauliflower, Rape, Turnep, &c.
 1 Brassica oleracea capitata Oleraceous or common culinary heading cabbage b.
 ———Earliest dwarf cabbage
 ———Early Yorkshire cabbage
 ———Early London hollow cabbage
 ———Early Battersea cabbage
 ———Early Russia cabbage
 ———Early sugar-loaf cabbage
 ———oler.

- *Large sugar-loaf cabbage*, most excellent
- *Hollow sugar-loaf cabbage*, very fine
- *Large hollow autumn cabbage*
- *Long-sided cabbage*
- *Drum hollow cabbage*, very large, flat-headed
- *Round-headed cabbage*
- *Great white Scotch cabbage*
- *American cabbage*
- *Penton cabbage*
- *Red Dutch cabbage*
- *Savoy curled-leaved heading cabbage*, commonly called Savoy b.
- *Green savoy*
- *Yellow savoy*
- *Sabellican, jagged and fringed-leaved, loose, open cabbage or colewort*, commonly called Borecole b.
- *Green borecole*
- *Brown or purple borecole*
- *Variegated borecole* b.p.
- *Finely fringed-leaved borecole*
- *Tallest Anjou borecole*, called Anjou cabbage b.
 - proper, both for the table and to feed cattle; grows four or five, to six or eight feet high, producing a vast abundance of sprouts from the sides of its stem, like the common borecole

— *oler. sabauda capitata*

— *oler. sabellica lasiniata*

oler.

- *Milan borecole*, called
Milan cabbage, or Choux
de Milan *b. p.*
- *Brussels borecole*, called
Brussels sprouts *b. p.*
- *Scotch borecole* or *Kale* *b.*
Plane-leaved open green
colewort cabbage, or com-
mon old hardy colewort *b.*
- *Perennial open green*
colewort *p.*
- *Napo-brassica* [*Napo-brassica*] Rape-rooted
or turnep-cabbage *b. p.*
Consisting of the
 - *Turnep-rooted cabbage*
 - *Turnep-stalked cabbage*
- *botrytis cauliflora* [*Cauliflora*] Clustered head-
ed brassica, commonly
called cauliflower. *a. b.*
 - *Early cauliflower*
 - *Late cauliflower*
- *Italica* Italian brassica, commonly
called broccoli, a variety
of cauliflower *a. b.*
 - *Early purple broccoli*
 - *Large late purple broc-*
coli
 - *Branching purple broc-*
coli
 - *Green broccoli*
 - *Brown hardy broccoli*
 - *Dwarf late purple broc-*
coli
 - *White, or cauliflower*
broccoli
- 2— *BRASSICA Napus* [*Napus*] Navew, or rape
colewort, commonly call-
ed rape *b.*
 - Common rape, or cole-
feed,—is cultivated prin-
cipally, both to gather
young,

—Napus alba

3—Brassica Rapa

4 —Brassica Eruca

CALENDULA,
—officinalis

CAMPANULA

—Rampunculus

CICHORIUM
—Endivia

COCHLEAREA

—Armoracia

young, as a small salad-herb, in gardens;—and in fields to attain full growth, for feeding of cattle, and for its seed to make rape-oil, &c.

White navew, or French turnep, long spindle-rooted [Rapa] or Turnep a.b.

—Early orbicular Dutch turnep.

—Early white-stone turnep

—Early red-stone turnep

—White round turnep

—Red-topped turnep

—Green-topped turnep

—Large Norfolk turnep

—Oblong turnep

—Yellow turnep

[Eruca] Rocket, or mustard colewort a.

MARIGOLD

Officinal, or common marigold a.

—Common single-flowered

—Double-flowered

—Lemon-coloured flowered

(BELL-FLOWER) Rampion

[Rampunculus] Rampion-Root, or rampion b.

(SUCCORY) or Endive

[Endivia] or endive a.b.

—Green curled endive

—White curled endive

—Broad-leaved Batavia endive

(SPOONWORT) Horse-Radish

[Armoracia] or horse-radish p.

CORI-

CORIANDRUM

—*sativum*

CRAMBE

—*maritima*

CUCUMIS

1 —*sativus*

2 —*Melo*

3 —*Anguria*

CORIANDER

Cultivated garden coriander *a.*

SEA-COLEWORT, or Cabbage

Maritime colewort, or sea-beach cabbage *p.*

CUCUMBER, and Melon

Cultivated or common cucumber *a.*

—*Early frame cucumber*

—*Short prickly cucumber*

—*Long prickly cucumber*

—*Cluster prickly cucumber*

—*White prickly cucumber*

—*Green long Turkey cucumber*

—*White long Turkey cucumber*

—*Large white Dutch cucumber*

[*Melo*] or Melon *a.*

—*Romana melon*

—*Cantaleup, or warted melon*

—*Rock cantaleup melon*

—*Black-Rock cantaleup melon*

—*Silver cantaleup melon*

—*Orange cantaleup melon*

—*Netted-rinded melon*

—*Green smooth-rinded melon*

—*Green-fleshed melon*

—*Small round Portugal melon*—with many other intermediate varieties

[*Anguria*] or water-melon *a.*

—*Green-fleshed*

—*Red-fleshed*

CYNARA

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CYNARA

1—*Scolymus*

2—*Cardunculus*

DAUCUS

—*Carota*

HELIANTHUS

—*tuberosus*

HYSSOPUS

—*officinalis*

LACTUCA

—*sativa*

ARTICHOKE and Chardon

[*Scolymus*] or artichoke p.

—*Globe artichoke* p.

—*Conical green artichoke*

[*Cardunculus*] Chardon or

Cardoon b.

CARROT

[*Carota*] or Carrot b.

—*Early horn carrot*

—*Early short orange carrot*

—*Long orange carrot,*

for the main crops

—*Yellow carrot*

—*White carrot*

[*Sun-flower*] Jerusalem Arti-
choke

Tuberous-rooted Helian-
thus, or Jerusalem Arti-
choke p.

HYSSOP

Officinal or common Hyf-
sop p.

—*Blue-flowered*

—*White-flowered*

—*Red-flowered*

—*Curled-leaved*

LETTUCE

Cultivated or common gar-
den Lettuce a. b.

—*White cabbage lettuce*

—*Brown Dutch cabbage*
lettuce

—*Grand admirable cab-*
bage lettuce, very large

—*Green hardy cabbage*
lettuce

—*Tennis ball cabbage let-*
tuce

—*Green Cilicia lettuce*

—*Brown Cilicia lettuce*

—*White Cilicia lettuce*

LEPI-

LEPIDIUM

—*sativum*

LAVANDULA

1—*Spica*

2—*Stæchas*

MELISSA

—*officinalis*

MENTHA

1—*viridis* [*spicata*]

2—*rotundifolia*

3—*piperita*

4—*Pulegium*

ORIGANUM

1—*vulgare*

2—*heracleoticum*

—Green *cos* lettuce
 —White *cos* lettuce
 —Red *cos* lettuce
 —Spotted *cos* lettuce
 —Egyptian *cos* lettuce
 —Imperial lettuce
 —Capuchin lettuce
 —Honey lettuce
 —Forcing lettuce

CRESS

Cultivated or common
 Cress *a.*

—Common small-leaved
 —Broad-leaved
 —Curled-leaved.

LAVENDER

[*Spica*] Spiked flowering
 common Lavender *sb. p.*

—Narrow-leaved
 —Broad-leaved

[*Stæchas*] or French Laven-
 der *sb. p.*

BALM or Baum

Officinal or common Balm *p.*

MINT and Penny-Royal

Green or common spike-
 flowering or spear-Mint *p.*

Round rough-leaved spear-
 Mint *p.*

Pepper-Mint *p.*

[*Pulegium*] or Penny-Roy-
 al *p.*

—Upright Penny-Royal

—Broad-leaved Penny-
 Royal

ORIGANY or Marjoram

Common Marjoram *p.*

—Broad-leaved

—Curled-leaved

Heracleotic, or winter Mar-
 joram *p.*

O

3—*onites*

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- 3—*onites*
4—*Majorana*

OCIMUM

- 1—*Basilicum*

- 2—*minimum*

PASTINACA

- sativa*

PHASEOLUS

- 1—*nanus*

- 2—*vulgaris* [*scandens*]

Pot-Marjoram *sb. p.*
[*Majorana*] Sweet or knot-
ted summer Marjoram *a.*

BASIL

[*Basilicum*] common Sweet-
Basil *a.*

- Broad-leaved*
—*Narrow-leaved*
—*Curled-leaved*
—*Fringed-leaved*
—*Green studded leaved*
—*Purple-leaved*
—*Three-coloured-leaved*
Least or Bush-Basil *a.*
—*Smooth-leaved*
—*Hoary-leaved*
—*Variable-leaved*

PARSNAP

Cultivated common Pars-
snap

KIDNEY-BEAN

Dwarf Kidney-Bean *a.*

- Early speckled dwarf*
—*Early white dwarf*
—*Early yellow dwarf*
—*Liver-coloured dwarf*
—*Black-speckled dwarf*
—*Red-speckled dwarf*
—*Negroe dwarf*
—*Battersea white dwarf*
—*Canterbury white dwarf*
—*Larger white dwarf*
—*Amber-speckled dwarf*
—*Sparrow-egg dwarf*

Common climbing or run-
ning Kidney-Bean, com-
monly called Runners *a.*

- Scarlet-flowered runner*
—*or scarlet bean*
—*Large white runner*

POR-

PORTULACA

—oleracea

PISUM

—sativum

—Large long-podded white
Dutch runner

—Battersea runner

—Canterbury runner

—Variable runner

PURSLANE

Oleraceous or Pot-herb Purslane and for sallads a.

—Green purslane

—Golden-purslane

PEA

Cultivated or common Pea a.

—Dwarf early frame pea

—Early golden hotspur pea

—Nicholas early golden pea

—Early Charlton hotspur
pea

—Masters hotspur pea

—Essex hotspur pea

—Long-pod hotspur pea

—Leadman's dwarf pea

—Dwarf marrowfat pea

—Large marrowfat pea

—Grey rouncival pea

—Green rouncival pea

—White rouncival pea

—Blue rouncival pea

—Dwarf-crooked sugar
pea

—Large crooked sugar pea

—Spanish morotto pea

—Green nonpareil pea

—Pearl pea

—Large egg pea

—Blue union pea

—Grey cluster pea

—Crown or rose pea,
bearing its blossom and
pods in a cluster at the
top of the stalk

—Blue dried boiling pea

—White dried boiling pea

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POTERIUM

— *Sanguisorbia*

RAPHANUS

— *sativus*

ROSMARINUS

— *officinalis*

RUTA

— *graveolens*

RUMEX

— *Acetosa*

BURNET

[*Sanguisorbia*] or common garden Burnet p.

RADISH

Cultivated or common Radish a. b.

Spindle-rooted varieties

— *Early dwarf short-topped radish*

— *Early dwarf salmon short-topped radish*

— *Common London short-topped radish*

— *Common salmon radish*

— *White radish*

— *Yellow radish*

Turnep-rooted kinds

— *White Italian turnep-rooted radish*

— *Red Italian turnep-rooted radish*

— *Large black turnep-rooted Spanish radish*

— *Large white turnep-rooted Spanish radish*

ROSEMARY

Officinal or common Rosemary sh. p.

— *Narrow-leaved*

— *Broad-leaved*

RUE

(Rank-smelling,) or common Rue sh. p.

— *Common broad-leaved*

— *Narrow-leaved*

(Dock) SORREL

[*Acetosa*] or common garden Sorrel p.

— *Broad-leaved*

— *Narrow-leaved*

— *Round-leaved*

— *Curled-leaved*

— *scutata*

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— <i>scutata</i>	Scutated, or target-shaped-leaved French sorrel <i>p.</i>
— <i>tuberosus</i>	— <i>Creeping French sorrel</i> Tuberous-rooted Italian sorrel <i>p.</i>
SALVIA	SAGE, Clary, &c.
1— <i>officinalis</i>	Officinal, or common sage - - - <i>sh. p.</i>
	— <i>Common red sage</i>
	— <i>Green sage</i>
	— <i>Broad hoary-leaved balsamic sage for tea</i>
	— <i>Lesser aurited narrow-leaved sage, or sage of virtue</i>
	— <i>Variegated-leaved sage</i>
2— <i>Sclarea</i>	[<i>Sclarea</i>] or garden Clary <i>b.</i>
SATUREJA	SAVORY
1— <i>hortensis</i>	Garden or summer Savory <i>a.</i>
2— <i>montana</i>	Mountain or winter savory <i>p.</i>
SCANDIX	CHERVIL
— <i>Cerrefolium</i>	[<i>Cerrefolium</i>] or common sweet Chervil <i>a.</i>
SCORZONERA	[SCORZONERA] or Viper's-Grafs
— <i>hispanica</i>	Spanish or garden Scorzonera <i>a. b. p.</i>
SINAPIS	MUSTARD
1— <i>alba</i>	White Mustard <i>a.</i>
2— <i>nigra</i>	Black or brown Mustard <i>a.</i>
3— <i>arvensis</i>	Field or Durham Mustard <i>a.</i>
SISYMBRIUM	[<i>Water-Parsnep</i>] WATER-CRESS
— <i>Nasturtium</i>	[<i>Nasturtium aquaticum</i>] or common Water-Cress <i>p.</i>
SIMUM	SKIRRET
— <i>Sisarum</i>	[<i>Sisarum</i>] or common Skirret <i>b. p.</i>
	O 3 SMYR-

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SMYRNIUM

— *Olivifarium*

SOLANUM

1 — *tuberosum*

2 — *Lycopersicon*

SPINACIA

— *Oleracea*

TANACETUM

1 — *vulgare*

ALEXANDERS

[*Olivifarium*] or common Alexander, or Alifander b. (Nightshade) POTATOE and Love-Apple

Tuberous-rooted Nightshade, commonly called Potatoe p.

— *Early dwarf potatoe*

— *Red round potatoe*

— *White round potatoe*

— *Oblong red potatoe*

— *White kidney-shaped potatoe*

— *Large white oblong red-ended potatoe*, called *red-nosed kidney*

— *Conglomerated or clustered American potatoe*, chiefly for feeding cattle

[*Lycopersicon*] Wolfs-Peach, commonly called Love-Apple or Tomato a.

— *Common large red-fruited love-apple*

— *Yellow-fruited*

— *White-fruited*

— *Cherry-shaped red-fruited*

— *Cherry-shaped yellow-fruited*

SPINACH

Oleraceous or common culinary Spinach a. b.

— *Prickly-seeded triangular-leaved spinach*

— *Smooth-seeded round-leaved spinach*

TANSEY

Common Tansey p.

— *Plane-leaved*

— *Curled-leaved*

2 — *Bal-*

- 2—*Balsamita* [Balsamita] or Costmary *f.*
 TRAGOPOGON (Goat's-Beard) SALSAFY
 —*Porrifolium* Leek-leaved, Goat's-beard,
 or common Salsafy *b.*
 TROPÆOLUM NASTURTIIUM or Indian
 Cress
 1—*minus* Smaller intire-leaved Indian
 Cress or Nasturtium *a.p.*
 2—*majus* Greater Indian Cress or
 Nasturtium, with nearly
 five-lobed-leaves *a. p.*
 THYMUS THYME
 1—*vulgaris* Common Thyme *fb. p.*
 —*Broad-leaved*
 —*Narrow-leaved*
 —*Striped-leaved*
 2—*Serpillum* [Serpillum] or mother of
 Thyme *fb. p.*
 —*Common mother of thyme*
 —*Lemon thyme*
 —*Silver-striped thyme*
 —*Hairy narrow-leaved*
 VALERIANA [Valerian] Lamb's-Lettuce,
 or Corn-Sallad
 1—*Locusta* [Locusta] Field Corn-Sallad,
 with linear leaves *a.*
 —*olitoria* Garden Corn Sallad, with
 spear-shaped entire leaves
 VICIA [Vetch] BEAN
 1—*Faba* [Faba] or common garden
 Bean *a.*
 —*Early small mazagan*
bean
 —*Early Lisbon bean*
 —*Early small Spanish bean*
 —*Broad Spanish bean*
 —*Long podded bean*
 —*Sword-long podded bean*
 —*Toker bean*
 —*Windfor Bean*
 —*Green nonpareil bean*
 2—[Faba]

2—[*Faba minor*]*

CAPSICUM

—*annuum*

CUCURBITA

1—*Pepo*2—*Melopepo*3—*verrucosa*4—*lagenaria*5—*Citrullus*—*White blossom bean*—*Mumford bean*—*Red-blossom bean*—*Dwarf fan-cluster bean*

Lefser, or Horse-Bean

[*Capsicum*] or GUINEA-
PEPPERAnnual, or common *Capsi-*
cum—many varieties:

viz.

a.

—*Red-podded*—*Yellow-podded*—*Long-podded*—*Short-podded*—*Heart-shaped-podded*—*Bell-shaped*—*Upright-podded*—*Pendulous-podded*—*Cherry-shaped-podded*PUMPKIN, or Pumpkin,
Gourd, &c.[*Pepo*] or common Pumpkin,
or Pumpkin a.—*Great round-fruited*—*Smaller round-fruited*—*Orange-shaped-fruited*—*Pear-shaped-fruited*—*Green-fruited*—*Yellow-fruited*—*White-fruited*—*Party-coloured*—*Marbled*—*Striped*[*Melopepo*] or depressed knot-
ty Gourd or Squash a.

Warty Carbuncled Gourd a.

Bottle, or Horn-Gourd—
very long fruited a.[*Citrullus*] Water-Melon a.

SECOND

SECOND DIVISION.

ARRANGEMENT

OF THE

FRUIT - TREES.

Comprising all the genera species and varieties of fruit-trees, proper for propagation, both as standards, half-standards, and for walls and espaliers; all the species and varieties arranged in systematic order, in their respective genera or families, agreeable to the laws of Botany or sexual distinctions of nature.

GENERAL OBSERVATIONS.

IT may be necessary, just to observe, that all the species and varieties of fruit-trees, and fructiferous shrubs, arranging in this division, being universally perennial, or of many years duration in root, stem, and branches; their propagation is effected various ways, such as sometimes by seed, to gain new varieties; and some sorts principally by

seed only, as in some of the nut-bearing kinds, as walnut, chesnut, hazel-nut; also sometimes the common bitter almond, elderberry tree, berberry, &c. though far the greater part of our cultivated fruit-trees are propagated commonly by several other methods. in order to obtain, or continue, with certainty, the different approved varieties of the respective species permanent, or always of the same kind; as they in most sorts commonly degenerate, or vary exceedingly, when raised from seed: so that the most certain methods of propagation, by which to multiply and continue the varieties permanent, is effected either by grafting or budding; as in apples, pears, plums, cherries, medlars, quinces, peaches, nectarines, almonds, apricots, &c. or by suckers, layers, and cuttings; as in figs, vines, mulberry, filbert, gooseberry, currant, raspberry, berberry, &c.

But in our principal fruit-trees, that produce the capital and most useful fruits, their propagation is effected mostly by grafting and budding; such as in all species and varieties of the genus, *amagdalus* or almond; comprising the common almond-tree, peach and nectarine, which are all propagated most commonly by budding upon plum-stocks: also the species of the *prunus* or plum-tree, consisting of the different species of the plum, cherry, apricot, &c. in all their varieties, are all propagated

pagated mostly by budding, and sometimes by grafting; the plum upon plum-stocks, cherries upon cherry-stocks, and apricots upon plums mostly: and the genus *Pyrus*, comprising the pear, apple, and quince, are all propagated mostly by grafting upon stocks of their own kind; the pear also, occasionally, by budding; also the medlars, chiefly by grafting and budding upon stocks of their own family or genus; and sometimes any improved varieties of the service-tree, azarole, and filbert, are also propagated by grafting and budding.

For grafting and budding being, not only a most sure method to obtain always the same sorts without degeneracy, but the trees, raised by that method, much sooner arrive to a bearing state, prove abundantly more fruitful, and the fruit generally superior than of trees raised from seed.

Observing, in general, in the propagation by grafting and budding, that principally none but the species of the same family or genus will succeed upon one another; that is, the stocks or stems, upon which the grafting or budding is to be performed by inserting the grafts or buds therein, must be young trees of the same genus, as that of the trees from which the grafts and buds are to be taken, or at least of the same class and order, otherwise the grafts and buds will not take or unite therewith; as for example, the amygdalus or almond, comprising also the peach and nectarine, being all

of the same family, according to the order of nature in their botanic sexual distinction, will also grow upon one another; and also any of these upon the plum, which, though not of the same genus, it is nearly allied, in belonging to the same class and order, (*Icosandria monogynia*) and is the common stock in repute, on which to bud all or most of the varieties of these trees, particularly the peach and nectarine; and again, the *prunus* or plum, comprising the cherry and apricot as species of the same family, they will all grow upon one another by grafting or budding: but notwithstanding this, the plum is most successful upon plum stocks, and the cherry upon those of any of the cherry kind; and the apricot succeeds best upon plum-stocks: again, the apple, pear, and quince, being all of one family, will graft or bud upon each other; however, the apple is always most successful on stocks of the apple kind, and pears upon pear-stocks, and occasionally on quinces, to dwarf them when required for low walls or espaliers; or pears will also grow upon medlars, white-thorn, and service-tree, as being all of the same botanic class; and the medlar is also of the same order in that class: but the other two are not, though are all so nearly allied in their sexual nature as they will grow by grafting or budding upon one another, but generally not near so successful as on stocks of their own family and kind; and the pear

in

in particular, never succeeds near so well on any as its own stock, raised from the kernels of any sort of pear, or upon quince-stocks, as aforesaid, which is of the same genus or family.

Thus, in the propagation of fruit-trees, by grafting and budding, it must be remembered, to have stocks for the reception of the grafts and buds, principally either of their own family, of the kinds of fruit intended for propagation, or so nearly related as to be of the same class and order; though rather always of the same genus principally, except in some particular sorts, such as plum-stocks for peach and nectarines; and the stocks for these two methods of propagation, may be raised, either from seed, i. e. the kernels, stones, nuts, &c. of the respective fruits, or by suckers from the roots thereof, in such as produce suckers, as in plum, pear, quince, &c.

But the propagation of fruit-trees by suckers, layers, and cuttings, without being grafted, is also successfully effected in several most eminent kinds, and the varieties thereof continued the same; and are the principal methods of propagation, for many valuable species and varieties of the fruit-tree tribe, such particularly as the fig, which is commonly propagated by all these three methods, and the vine always by layers and cuttings; also the mulberry-tree chiefly by these two last
men-

mentioned methods of propagation : likewise all the varieties of the gooseberry and currant are always propagated principally only by suckers and cuttings, and will also grow most freely by layers : and by suckers and layers may propagate the berberry, filbert, and all the other varieties of hazel-nut, quinces, &c. the latter also by cuttings ; as likewise the elder-berry tree ; and by suckers from the root, the raspberry plant propagates most abundantly, and is the principal method of its propagation.

However, when desirous of obtaining new varieties of any species of fruit-tree, recourse may be had to the propagation by seed, though this, in many sorts, is a tedious process, as some trees will be many years before they bear, but there is no other method to gain new varieties : others again will attain a bearing state in three or four years, such as gooseberries particularly, which are very prolific in varieties ; and great numbers of valuable new sorts have been lately obtained by that method of propagation : but, as just above re- it is universally to be observed, that in all species whatever, of the fruit-tree kind, &c. in which new varieties are required, it is always effected by the propagation by seed only ; for the seedling plants, in most sorts are sportive in varieties, and rarely produce the same sorts again from seed, but vary to others that are often in the greater part much inferior to the original ; and sometimes out of many, some new varieties of
 supe-

superior qualities are acquired, or at least of esteemed good properties to be ranked among the principal fruits; which determines, that by the propagation by seed, all the different valuable varieties of our cultivated fruits were originally and accidentally obtained: and these thus acquired, were multiplied, from time to time as they occurred, and continued permanent in their kind, by propagating them by the other methods before-mentioned; and as is fully explained under their respective articles, in the general work of the *propagation of the vegetable kingdom*.

But as most of those fruit trees commonly propagated principally by seed, such as the chesnut, walnut, and sometimes hazel-nut, &c. are prolific in different varieties, the two latter particularly, there is no certainty of obtaining exactly the same sorts again; and all that can be done is, to procure, for sowing, the largest and finest nuts, &c. of their respective kinds.

As all the plants of this division are of the tree and shrub kind, of a woody durable nature, perennial in root, stem, and branches, there is no occasion for any marks of distinction of their duration, as in the kitchen-garden division, where the plants are of three different states of durability.

In

In the following arrangement of the fruit-trees, all the genera are registered by their Generical, Botanical, Latin and English names; and under each genus is arranged all the species and varieties belonging thereto, according to the rules of botany and scientific sexual distinctions, as explained in the description of the twenty-four botanic classes, into which the whole vegetable kingdom is systematically divided.

AMYGDALUS

ALMOND-TREE, comprehending also the Peach and Nectarine, as species of the same genus or family

1—*communis*

Common Almond-tree, comprising the Varieties

—Bitter kernelled almond.

—Sweet kernelled almond.

—Jordan Almond

—Tender-shelled almond

2 *Amygdalus Persica*

[*Persica*] or Peach-tree consisting of many varieties, viz.

—Early white nutmeg peach

—Early red nutmeg peach

—Early purple peach

—Early small mignon peach

—White Magdalen peach

—Red Magdalen peach

—Large Mignon peach

—Early Newington peach

—Old Newington peach

—Montauban peach

—Chevereuse peach

3—*Amyg-*

- Chancellor peach
- Gallande or Belle-Garde-
peach
- Nobleſſe peach
- Royal-George peach
- Admirable peach
- Roſanna peach
- Yellow Alberge peach
- Venus-breſt peach
- Sion peach
- Bourdine peach
- Rambouillet peach
- Nivette peach
- Periſque peach
- Late purple peach
- Belle de Vitri peach
- Swalſh peach
- Vanguard peach
- Scarlet Muſcat peach
- Incomparable peach
- Bloody peach
- Monſtrous pavy peach
- Catharine peach
- Dwarf Malta peach
- Dwarf Orleans peach
- Double Montagne peach
- 3—Amygdalus Nuci-
perſica [Nuciperſica] or Neſtarine-
Tree
- Early fairchild's neſta-
rine
- Early violet neſtarine
- Newington neſtarine
- Elruge neſtarine
- Red Roman neſtarine
- Murrey neſtarine
- White neſtarine
- Brugnon neſtarine
- Temple neſtarine
- Scarlet neſtarine
- Peterborough neſtarine

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BERBERIS

— *vulgaris*

— *Golden nectarine*

— *Cleremont nectarine*

BERBERRY-TREE

Common Berberry-tree

— *Common red stoney-fruited*

— *Stoneless red fruited*, the most esteemed

— *White-fruited*

CORYLUS

HAZEL Nut-tree, Filbert, &c.

1— *Avellana*

[*Avellana*] or common Nut-tree

— *Common hazel nut*

— *Large clustered hazel nut*

— *Long broad hazel nut*

— *Red filbert nut*

— *White filbert nut*

— *Barcelona or Spanish filbert nut*

— *Great cob nut*

2— *Colurna*

[*Colurna*] Byzantine, or Constantinople Hazel Nut

3— *cornuta*

Horned, or American Cuck-old Nut

CRATÆGUS

WILD-SERVICE

1— *terminalis*

[*Griping four-fruited*] or common Wild Service-berry-tree

2— *Azarcus*

[*Azarcus*] or Azarole Wild Service

FAGUS

[*Beech*] CHESNUT-TREE

— *Castanea*

[*Castanea*] or Chesnut-tree
Cultivated large Spanish chesnut

— *Small wild chesnut*

FICUS

FIG-TREE

— *Carica*

[*Carica*] or common Fig-tree

— *Early long blue fig*

Juc-

—Early white Marseilles
fig

—Common blue fig

—Brown ischia fig

—Green ischia fig

—Black ischia fig

—Large white fig

—Brunswick or Madonna
fig

—Brown Naples fig

—Large blue-purple fig

—Multa fig

—Yellow Cæsar fig

—Green Naples fig

—Black Provence fig

JUGLANS

—regia

WALNUT-TREE

Royal or common Walnut-
tree

—Early oval walnut

—Round walnut

—Large walnut

—French walnut

—Tender-shelled walnut

MESPIBUS

—germanica

MEDLAR-TREE

German or common medlar-
tree

—Greater Dutch medlar

—Smaller Nottingham
medlar

—Pear-shaped medlar

MORUS

1—nigra

2—alba

3—rubra

PRUNUS

1—domestica

MULBERRY-TREE

Black common Mulberry

White Mulberry

Red Mulberry

PLUM-TREE, also Cherry
and Apricot

Domestic or common culti-
vated Plum-tree, com-
prising many varieties of
the fruit: viz.

—Early white primordian

—Early

- Early black damask plum
- Azure native plum
- Early tours plum
- Morocco plum
- Great violet damask plum
- Red Orleans plum
- White Orleans plum
- Blue perdrigon plum
- White perdrigon plum
- Black perdrigon plum
- Fotheringham plum
- Red imperial plum
- White bonum magnum, or egg plum
- Red bonum magnum
- Green-gage plum
- Blue gage plum
- Queen Claude green-gage
- Little Queen Claude plum
- White prunella plum
- Cheston plum
- Maitre Claude plum
- Myrobalan plum
- Imperatrice, or Empress plum
- Apricot plum
- Royal plum
- Diapre plum
- Semian plum
- Drap d'Or or cloth of gold plum
- La Mirabelle plum
- Brignole plum
- Roche Courbone plum
- Violet plum
- White matchless plum
- William de Roi
- Cherry plum
- Turkey plum

2—inf.

- 2—*infinitia*
 3—*spinosa*
 4—*Prunus Cerasus*
 5—*[Cerasus] avium*
 6—*Prunus Armeniaca*
- Damson plum, or damson
 —Muscle plum
 —St. Julian plum
 Wild Plum, or Bullace-tree
 —White bullace
 —Black bullace
 Thorny Wild Plum, or Sloe-tree
 —Common black sloe
 [*Cerasus*] or common Cherry-tree—many varieties of the fruit; viz.
 —Early May cherry
 —Early May-Duke cherry
 —Arch-Duke cherry
 —White-heart cherry
 —Black-heart cherry
 —Kentish cherry
 —Bleeding-heart cherry
 —Amber-heart cherry
 —Ox-heart cherry
 —Harrison's-heart cherry
 —Lukeward cherry
 —Carnation cherry
 —Tradescant's cherry
 —Yellow Spanish cherry
 —Dwarf cherry
 (Bird's Cherry) or great wild Cherry-tree
 —Small black-fruited, or common black cherry
 —Small red cherry
 —Large wild red cherry or Geens
 —Large black, or Coroune cherry
 [*Armeniaca*] or Apricot-tree
 —Early masculine apricot
 —Orange apricot
 —Roman apricot
 —Turkey apricot
 —Algiers apricot

PYRUS

1—*communis*

- Dunmore apricot, or
Moor-Park peach
- Transparent apricot
- Breda apricot
- Brussels apricot

PEAR-TREE, also Apple and
QuinceCommon Pear-tree—many
varieties of the fruit: viz.

I. Summer pears, or such as
ripen for eating immedi-
ately off the tree, from the
middle of July till Sept.
and will not keep.

- Little musk, or supreme
pear
 - Red muscadelle
 - Primitive pear
 - August muscat pear
 - Fargonelle pear, pro-
perly Cuisse Madam
 - Cuisse Madam pear,
properly Fargonelle
 - Windor pear, very like
the Cuisse Madam, so called
 - Citron des Carmes
 - Summer bergamot pear
 - Summer boncretion pear
 - Gros blanquet pear
 - Long-stalked blanquet
pear
 - Green casselet pear
 - Orange bergamot pear
 - Early Russelet pear
 - Rose water pear
 - Princes pear
 - Pear piper
 - Perfumed pear
- Sum-

—Summer-mouth water-pear

—Salviati pear

II. Autumn pears, or such as ripen for eating in Sept. and October, and will not keep long.

—Autumn bergamot

—Hamden's bergamot

—Brown buerre

—Grey buerre

—Swiss bergamot

—Messire Jean pear, commonly called Monsieur John

—Verte longue, or long green pear

—Brocas's bergamot

—Green sugar pear

—Marquis pear

—Dean pear

—Chat brule, or burnt-cat pear

—Dauphin pear

—Gansel's bergamot

—Great russet pear

—Muscat fleury pear

—Rousseline pear

—Grey-good-wife pear

—Pendar, or knaves pear

—Musk robine pear

—Swan-egg pear

III. Winter pears, or such as ripen after being gathered, in November, December, January, &c. until March and April.

—Cresan pear

—Colmar pear

—St.

- St. Germain pear
- Best Chaumontille pear
- Virgoleuse pear
- Spanish boncretion
- Winter russelet
- Winter boncretion
- Wonder of winter
- Saint Martial pear
- Winter buerre
- Winter verte longue
- Best de Cassoy pear
- Winter orange pear
- Ambrette pear
- German muscat
- Chateau du Roi bergamot
- Martin Sec, or dry Martin pear
- Echasserie, or winter-green sugar pear
- Winter thorn-pear
- Seven-elbowed Portugal pear
- Easter bergamot
- Holland's bergamot
- Carmelite pear
- Good-Lewes pear
- For baking.
- Cadillac
- Pound pear, or great black pear of Worcester
- Uvedales St. Germain
- Sanguinole, or bloody pear
- Winter citron pear
- [Malus] or Apple-tree—many varieties of the fruit: viz.
- Early jenneting, or June-eating apple
- Early Margarat apple
- Common codlin
- Dutch

2—*Pyrus Malus*

- Dutch codlin
- Summer pearmain
- Siberian crab
- Nonesuch apple
- Golden rennet
- Kentish codlin, or fill
basket
- Summer queening apple
- Kitchen rennet
- Transparent apple
- Lemon pippin
- Summer rembourge
- Red colvil apple
- White colvil apple
- Golden pippin
- Aromatic pippin
- Nonpareil
- Loans pearmain
- Royal pearmain
- Herefordshire pearmain
- Royal russet
- Wheeler's russet
- Golden russet
- Kirton pippin
- Winter pearmain
- Pile's russet
- Holland pippin
- Kentish pippin
- French pippin
- Leather-coat russet
- Acklam's russet
- Monstrous rennet
- Cat's-head
- Norfolk Paradise apple
- Newton pippin
- Norfolk storing apple
- Spencer's pippin
- Rennet grise
- Grey Leadington apple
- Anise apple
- Violet apple
- Margill apple

- Lawman's apple
 - Embroidered apple
 - Gilliflower apple
 - Spitsenberg apple
 - Quince apple
 - Queen Charlotte apple
 - Stone pippin
 - American apple
 - Winter greening
 - Pomme du Roi
 - Glory of the West apple
 - Pomme d' Api
 - John apple
 - Aromatic Russet
 - Two-years apple
 - Barnard's baking apple
- Apples proper only for
Cyder.

- Red-streak apple
 - Royal wilding
 - White sour apple
 - Everlasting hanger
 - Styre apple
 - Blackmoor apple
 - Herefordshire underleaf
 - Gennet moyle
 - Woodcock's apple
- Note, Cyder may be also
made of any sort of Apples.

3—*Pyrus Cydonia*

[*Cydonia*] or Quince-tree

- Portugal quince
- Apple-shaped quince
- Pear-shaped quince

RIBES

1—*rubrum*

CURRENT-TREE and
Gooseberry

Red fruited Currant-tree—
comprising varieties, both
of red and white fruit:
viz.

- Red Dutch currant
- White Dutch currant

2—*nigrum*

- *nigrum* — *Champaigne* pale-red
currant
Black Currant, or Squinancy
Berries
- *Ribes Grossularia* — *Pennsylvanian* black
currant
[*Grossularia*] Grossar or
Hairy-fruited Gooseber-
ry-bush
- *Uva-crispa* [*Uva-crispa*] or Smooth-
fruited Gooseberry-bush
- *reclinata* Reclining-branched Goose-
berry-bush; — *varieties of*
the three species of the
gooseberries, are
- Early black-red goose-
berry
- Early red gooseberry
- Hairy red gooseberry
- Smooth red gooseberry
- Red Champaign goose-
berry
- Large red gooseberry
- Large deep garnet goose-
berry
- Long red gooseberry
- Scarlet gooseberry
- Red raspberry goose-
berry
- Large tawney gooseberry
- Damson gooseberry
- Red Mogul gooseberry
- Red globe gooseberry
- Warrington red goose-
berry
- Early green gooseberry
- Hairy green gooseberry
- Smooth green gooseberry
- Green-gage gooseberry
- Green walnut gooseberry
- Large hairy green goose-
berry
- P 2 — Green

- Green sugar gooseberry
- Green globe gooseberry
- Green fig gooseberry
- Green Dorrington gooseberry
- Early white Dutch gooseberry
- Large crystal gooseberry
- Large amber gooseberry
- Large yellow gooseberry
- Round yellow gooseberry
- White heart gooseberry
- White globe gooseberry
- White Mogul gooseberry
- Long yellow gooseberry
- Rombullion gooseberry
- Large ironmonger gooseberry
- Lancashire gooseberry
- Hunt's gooseberry—with many other intermediate varieties of reds, blacks, greens, yellows, whites, amber, &c. known either by the names of the persons who raised them; places where raised; and various fancy names differing but little from the above.

RUBUS

—*idæus*

- [Bramble] RASPBERRY
- [Bramble of Ida] or common Raspberry-plant
- Red raspberry
- White raspberry
- Twice-bearing raspberry
- Prickly-stemmed raspberry
- Smooth-stemmed raspberry
- Cane raspberry

SAM

SAMBUCUS

—*nigra*

ELDERBERRY-TREE

Black-berried common Elder-tree

—*White-berried elder*

SORBUS

SORB, or cultivated Service-tree

—*domestica*

Domestic, or cultivated Service-tree

VITIS

VINE, or Grape-vine

—*vinifera*

[Wine-bearing] or common Vine, or Grape-vine;—many varieties of the fruit: viz.

—*July grape*—*White sweet-water grape*—*Black sweet-water grape*—*White muscadine grape*—*Black muscadine grape*—*Royal muscadine grape*—*Black cluster grape*—*Corinth grape*—*Cheffalas grape*—*White frontinac grape*—*Black frontinac grape*—*Grisley-red frontinac grape*—*Lombardy grape*—*White muscat-grape of Alexandria*—*Red Alexandrian muscat grape*—*Black Hamburgh grape*—*White Hamburgh grape*—*Blue Hamburgh grape*—*Red Hamburgh grape*—*Syrian grape*—*St. Peter's grape*—*Raisin grape*—*Claret grape*—*Rhenish grape*—*Parsley-leaved grape*

THIRD DIVISION.

A R R A N G E M E N T
OF THE
HARDY TREES AND SHRUBS,
FOR
FOREST-TREE AND ORNAMENTAL
P L A N T A T I O N S.

THIS division comprises all the numerous and valuable tribe of hardy trees and shrubs, both deciduous and ever-green kinds, that succeed all the year in the open ground, in hardy plantations, for use and ornament; consisting, both of all the sorts of forest-trees, proper to plant for timber, underwood, ornament, and various other purposes in planting; and of all the hardy ornamental-trees, flowering-shrubs and ever-greens, for furnishing all the various ornamental plantations, shrubberies, groves, thickets, clumps, groups, avenues, and other compartments in pleasure grounds, parks, fields, &c. as, likewise the different families

families and species of fruit-trees, to arrange in assemblage, for diversifying the shrubbery and pleasure ground, &c. as well as to produce fruit, and some of them also for timber-trees, &c. together with many aromatic under-shrubby kinds that are also arranged among the kitchen-garden plants; such as sage, hyssop, thyme, &c. that likewise afford an agreeable variety in the shrubbery.

They are all arranged botanically in distinct families or genera, agreeable to the botanical characters of the sexes and other essential parts of their flowers and fruit, of the respective species of each genus; consisting, some genera, of but one or two, and some of many species; all of which species, in each family bear one general mark of distinction in their sexual parts, the flower and fruit, &c. as just observed; which renders all the species of each genus kindred to one another; and all have the same generical name of the genus; distinguished each by a trivial or specific name, like the children of a family: and all trees of the same family or genus, will succeed by grafting and budding upon each other, which is not in general the case, or at least so successful with trees of a different family; for although some, not of the same genus, yet being of the same botanic class and order, will succeed by grafting and budding upon one another; such, for instance, as peaches

and nectarines upon plum-stocks; but in most other cases, trees of the same genus graft most successfully upon one another, and very often, varieties of one species of the same genus, are more successfully grafted upon each other, than upon others of a different species.

But the propagation of the tree and shrub kind, in this division, is effected in several different methods; such as by seed, suckers, layers, cuttings, slips, grafting, budding, and inarching, &c. as directed under each of these articles of propagation: and all of which may be performed in the natural ground, unless it may be thought eligible to assist any curious, scarce, or difficult-propagating sort, by artificial heat, in a hot-bed, &c. especially the seed, layers, or cuttings of such particular sorts.

As this division comprises both deciduous and evergreen trees and shrubs, they are distinguished by prefixing this mark † to evergreens: all of those without that distinction, are deciduous kinds.

Note, Deciduous trees and shrubs, are such as drop their leaves in winter; and evergreens, such as remain in green leaf all the year.

Several of the evergreens particularly, being rather somewhat tenderer than the deciduous kinds; more especially in their infant growth, require occasional protection in severe winters, particularly while young; such as
mag-

magnolia, and olive-tree; some cistuses, arbutus, green-tea-tree, alexandrian laurel, &c. as also some of the deciduous kinds; such as pomegranate-tree, sumner, or deciduous bay: most of which should either have shelter, while young, from frost, or some planted against a South wall.

Likewise, on account of the somewhat tender quality of several plants of this division, they are also placed among the greenhouse plants.

In this division, the deciduous trees and shrubs are more numerous than the evergreens, as may be observed by the distinctive marks to the evergreen species, in the arrangement following.

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ACER

1—*Acer campestre*

2—*Pseudo-Platanus*

3—*Platanoides*]

4—*tartaricum*

5—*pennsylvanicum*

6—*saccharinum*

7—*Negundo*

8—*monspessulanum*

9—*creticum*

10—*Opalus*

11—*floridanum*

12—*rubrum*

13—†*sempervirens*

ÆSCULUS

1—*Hippo-Castanum*

MAPLE-TREE

Campain, or common
Smaller Maple

[*Pseudo-Platanus*] Bastard-
Plane, Greater-Maple, or
Sycamore-tree

—*Variegated-leaved*

[*Platanoides*] or Plane-tree-
like Norway Maple

—*Jagged-leaved*

—*Variegated-leaved*

Tartarian Heart-leaved
Maple

Pennsylvanian Maple

Sacchariferous, or Sugar
American Maple—of its
juice or sap, extracted from
the growing trees, is
sometimes made sugar

[*Negundo*] Compound or
Ash-leaved Virginia Ma-
ple

Montpelier smooth-leaved
Maple

Cretan downy-leaved Ma-
ple

[*Opalus*] or round-leaved
Italian Maple

—*Cut-leaved*

Floridan Maple

Red, or scarlet-flowering
Virginia Maple

—*Common larger scarlet
maple*

—*Pale-red, or Sir Charles
Wager's scarlet maple*

Evergreen Maple

HORSE-CHESNUT-TREE

[*Hippo-Castanum*] Com-
mon Horse-Chesnut-tree

— or

- or Heptandrious-flow-
ered *Æsculus*
—*White striped-leaved*
—*Yellow striped-leaved*
2—*Pavia* [*Pavia*] Scarlet Horse-
Chefnut, or octandrious-
flowered *Æsculus*
—*Common scarlet flower-*
ing
—*Yellow-flowering*
AMORPHA BASTARD-INDIGO
—*fruticosa* Shrubby Bastard-Indigo
AMYGDALUS ALMOND-TREE; comprif-
ing alfo the Peach and
Nectarine
1—*communis* Common Almond-tree—
with glandules at the bafe
of the leaves; and with
flowers, moffly in pairs
—*Bitter almond*
—*Sweet almond*
—*White-flowering almond*
—*Red-flowering*
2—*nana* Dwarf Almond-tree, with
leaves taper at the bafe
—*Common fingle-flowered*
—*Double-flowered*
3—*Perfica* [*Perfica*] or Peach-tree,—
without glands at the
bafè of the leaves; and
with flowers fingly and
in pairs
—*Common peach-tree*—
many varieties of the
fruit: See the fruit-trees
—*Double-flowered peach-*
tree
—*Dwarf peach-tree*
4—*Nuciperfica* [*Nuciperfica*] or Nectarine-
tree, fupposed a variety
of the Peach
P 6 ANDRO-

324 BOTANICAL ARRANGEMENT OF THE

ANDROMEDA

1—† *Polifolia*

[*Andromeda*] Marsh-Cistus,
or Wild Rosemary

[*Polifolia*] Polium-leaved
Marsh Cistus, or Rosema-
ry-leaved *Andromeda*

—Major, or greater marsh
cistus

—Minor, or lesser marsh cist.

—Minimican, or diminu-
tive marsh-cistus

2—*mariana*

Maryland and Virginia
ovate-leaved *Andromeda*

3—*paniculata*

Panicle-flowering Virginia
Andromeda

4—*racemosa*

Racemous-flowering Penn-
sylvanian *Andromeda*

5—† *caliculata*

Caliculated, augmented,
or double-flower-cupped
Virginia *Andromeda*

6—*arborea*

Tree-like Virginia Andro-
meda—with oblong-o-
vate sharp-pointed leaves,
or Carolina Sorrel-tree

7—*deboecia*

Irish Whorts, commonly
called Cantabrian Heath

8—† *lucida*

Shining broad-leaved An-
dromeda

9—*ferruginea*

Ferrugineous, or iron-co-
loured ovate-leaved An-
dromeda

10—*pilulifera*

Pill-shaped--flowered An-
dromeda

11—*globulifera*

Globular-flowered Andro-
meda

12—† *myrtifolia*

Myrtle-leaved *Andromeda*

13—† *ferratifolia*

Sawed-leaved *Andromeda*

14—† *axillaris*

Axillary flowering Andro-
med

—Broad-leaved

—Narrow-leaved

ANNONA

[*Annona*] OR CUSTARD
APPLE of America

1—*tri-*

HARDY TREES AND SHRUBS. 325

1—*triloba*

Trifid, or three-lobed-fruited Carolina Annona

2—*glabra*

Smooth conical-fruited Carolina Annona

ARALIA

ANGELICA-TREE

1—*spinosa*

Spinous Aralia, or Angelica-tree

2—*nudicaulis*

Naked-stalked Aralia

ARBUTUS

[*Arbutus*] or Strawberry-tree

1†—*Unedo*

[*Unedo*] Common sawed-leaved Arbutus, or Strawberry-tree

—*Broad-leaved*

—*Narrow-leaved*

—*Curled-leaved*

—*Common white flowered*

—*Red-flowered*

—*Red-berried*

—*Yellow-berried*

—*Globular-berried*

—*Oblong-berried*

2†—*Andrachne*

[*Andrachne theophrasti*] or Eastern broad entire-leaved Strawberry-tree

3†—*Uva ursi*

[*Uva-ursi*] Bear-Berry, or Trailing Arbutus, with intire leaves

3†—*alpina*

—*Major, or greater*
Alpine Trailing Arbutus, with rough sawed leaves

ARISTOLOCHIA

BIRTHWORT

1—*arborescens*

Arboraceous or Tree-Birthwort,—with upright stalk and heart spear-shaped leaves

2—*odoratissima*

Odorous climbing shrubby Birthwort,—with heart-shaped leaves

ARTEMISIA

[*Mugwort*] SOUTHERN-wood and Wormwood

1—*Abrotanum*

[*Abrotanum*] or Southern-wood

2—[*Ab-*

- 2——[*Absinthium*] *arborescens* ———Broad-leaved
 ASCYRUM ———Narrow-leaved
 1——*Crux Andreæ* Tree Wormwood
 2——*Hypericoides* SAINT PETER'S WORT
 3——*villosum* [*Crux Andreæ*] St. Andrew's
 ASTRAGALUS Cross, or ovate-leaved
 ———*Tragacantha* Saint Peter's Wort
 ATRAGENE [*Hypericoides*] or Hypericum-like oblong leaved
 ———*alpina* Saint Peter's Wort
 ATRIPLEX Hairy-leaved St. Peter's Wort.
 ———*Halimus* [*Milk-Vetch*] GOAT'S-THORN
 AZALEA [*Tragacantha*] Tragacanth, or Goat's-Thorn
 1——*Azalea viscosa* [*Atragene*] Alpine double-three-leaved
 ———*visc. alba* Atragene, of Mount-Baldi and Siberia
 ———*variegata* [*Orach*] SEA PURSLANE-TREE
 ———*glauca* [*Halimus*] or Sea Purslane-tree
 ———*multiflora* [*Azalea*] or American upright HONEYSUCKLE
 ———*serotina* Viscous, or clammy-flowered white Azalea,—with rough-edged leaves
 ———*flamina rubris* ———Common white-flowered
 ———*arborescens* ———Variegated-flowered
 2——*Azalea nudiflora* ———Glaucous, or sea-green-leaved
 ——— ———Many-flowered
 ——— ———Serotinous, or late-flowering
 ——— ———Red-stamened
 ——— ———Tree viscous azalea
 ——— ———Naked-flowered red Azalea, with egg-oval leaves, and
 ——— ———*nudi.*

- long stamens of the flower
- nudi. rubra* — Common red-flowered
- latifolia* — Broad-leaved white-flowered
- variegata* — Variegated white-flowered, with red tubes and filaments
- carnea* — Flesh-coloured-flowered
- coccinea* — Scarlet-flowered
- crispa* — Crisped or fringed-flowered
- tomentosa* — Tomentose or downy white-leaved azalea
- 3 — *Azalea procumbens* Procumbent diffused branching mountain Azalea
- 4 — *Azalea lapponia* Lapland hollow dotted-leaved Azalea
- BACCHARIS [Ploughman's Spikenard]
- *kalimifolia* GROUNDSEL-TREE
Sea purslane-leaved Virginia Baccharis, commonly called Groundsel-tree
- BERBERIS BERBERRY-TREE
- *vulgaris* Common Berberry-tree
- Common red-berried
- Red-berried without stone
- White-berried
- BETULA BIRCH-TREE and Alder
- 1 — *Betula alba* White, or common European Birch-tree
- 2 — *nigra* Black Virginia Birch-tree
- 3 — *lenta* Limber-twigged, or Poplar-leaved Virginia Birch-tree
- 4 — *nana* Dwarf Lapland and Russian round-leaved Birch-tree
- 5 — *canadense* Canada tall Birch-tree
- 6 — *papyrifera* — Dwarf Canada birch
Paper-barked Birch-tree—
paper having been made of its bark
- 7 — *Be-*

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7—*Betula Alnus*

[*Alnus*] or Alder-tree

—*glutinosa*

—Common oblong-leaved

—*incana*

—Glutinous round-leaved

—*laciniata*

—Hoary-leaved

—Lacinated or jagged-leaved

—*americana*

—American dwarf alder

BIGNONIA

TRUMPET-FLOWER

1—*Bignonia Catalpa*

[*Catalpa*] or Tree upright, heart-leaved Trumpet-flower

—Common heart-shaped-leaved

2—*radicans*

—Egg-oval-leaved

Radicant, or rooting stalk-ed scarlet Trumpet-flower

—Larger, or common pinnated cut-leaved

—Lesser, Ash-leaved, with a small flower

3—†*sempervirens*

Evergreen, spear-leaved, climbing Bignonia

4—†*unguis-cati*

[Hooked-tendrill'd] or four-leaved Evergreen Bignonia

5—*stans*

Standing, or firm-stalked, pinnated-leaved Bignonia

6—*capreolata*

Capreolated, or clasper-ended, broad leaved Bignonia

BUPLEURUM

[*Hare's Ear*] Æthiopian HART-WORT

—*Bupleurum fruticosum*

Shrubby Hare's Ear, or Æthiopian Hart-Wort

BUXUS

BOX-TREE

1—†*Buxus sempervirens*

Evergreen common Box-tree

—†*arborescens*

—Common tree box

—Broad-leaved

—Narrow-leaved

—Myrtle-leaved

—Silver-striped-leaved

2—†*usf.*

- 2 — *suffruticosa* — Gold-striped leaved
 — Silver-edged-leaved
 — Gold-edged-leaved
 — Gold-tipped-leaved
 Under-Shrubby or Dwarf
 Box
 — Striped-leaved
 — Myrtle-leaved
 CALYCANTHUS CAROLINA ALL-SPICE
 1 — *Calycanthus floridus* Flowery Carolina All-spice,
 with longest interior
 petals
 2 — *præcox* Early Carolina All-spice of
 Japan, with minute in-
 terior petals
 CARPINUS HORNBEAM
 1 — *Carpinus Betulus* [*Betulus*] Common Horn-
 beam
 — Oak-leaved
 — Variegated-leaved
 2 — *Ostrya* [*Ostrya*] Hop-fruited Carpi-
 nus, or Hop Horn-beam
 — Maple-like hop horn-
 beam
 3 — *orientalis* Eastern Hornbeam
 CASSINE [*Cape Phillyrea*, *Hottentot*
Cherry, &c.] South Sea
 TEA-TREE
 — *Peragua* [*Peragua*] Cape Phillyrea,
 called South Sea Tea-tree
 — Alternate-leaved
 — Opposite-leaved
 See also the green-house
 plants
 CEANOTHUS NEW-JERSEY TEA
 — *Ceanothus americanus* American Trinervous, or
 three nerved-leaved Ce-
 anothus
 CELASTRUS [*Celastrus*] or STAFF-TREE
 1 — *Celastrus scandens* Scandent, or climbing Vir-
 ginia Celastrus, with ob-
 long sawed leaves
 2 — *bul-*

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- 2—*bullatus* Bullated, or Studded fruit-
ed Canada Celastrus, with
ovate leaves
- CELTIS
1—*Celtis australis* LOTE, or Nettle-tree
South-European ovate-
leaved Nettle-tree
- 2—*orientalis* Oriental, or Eastern heart-
leaved Nettle-tree
- 3—*occidentalis* Occidental, or Western A-
merican Nettle-tree, with
oblique ovate sawed leaves
- CEPHALANTHUS
—*occidentalis* BUTTON-TREE
Occidental, or American
Cephalanthus, with leaves
opposite, and by threes,
and round heads of flow-
ers.
- CERCIS
1—*Siliqueastrum* [*Arbor Judæ*] JUDAS-TREE
[*Siliqueastrum*] or common
European Judas-tree,—
with heart-orbicular
smooth leaves
- 2—*canadensis* Canada Judas-tree, with
hearted downy-leaves
- CHIONANTHUS
—*virginiana* SNOW-DROP-TREE
Virginia three-flowered
Snow-drop-tree
—*Broad-leaved*
—*Narrow-leaved*
- CISTUS
1—†*villosus Cistus* [*Cistus*] or Rock-Rose
Villose egg-oval-leaved Cist.
- 2—†*populifolius* Poplar-leaved Cistus
—*Major, or greater*
—*Minor, or lesser*
- 3—†*laurifolius* Bay-leaved Cistus
- 4—†*ladaniferus* Ladanum-bearing, or Gum
Cistus, its leaves exsuding
a gummy substance, like
Ladanum
—*White-flowered*
—*Spotted-flowered gum-*
cistus
- 5—*monf.*

HARDY TREES AND SHRUBS. 331

- 5——†*monspeliensis* Montpellier narrow spear-leaved Cistus
 - 6——†*incanus* Hoary spatule-shaped, wrinkled-leaved Cistus
 - 7——†*albidus* White ovate spear-leav'd Ci.
 - 8——†*creticus* Cretan, spatule ovate-leaved Cistus
 - 9——†*salvifolius* Sage-leaved Cistus
 - 10——†*crispus* Curled or waved-leaved Cist.
 - 11——†*halimifolius* Sea purslane-leaved Cistus
——*Broad-leaved*
——*Narrow-leaved*
 - 12——†*libanotis* Rosemary-like narrow-leaved Cistus
 - 13——†*appeninus* Apennine hairy spear-leaved Cistus
 - 14——†*italicus* Italian ovate and spear-leaved Cistus
 - 15——†*Helianthemum* [*Helianthemum*] or Sun-flower dwarf yellow Cistus
 - 16——†*lævipes* Smooth linear-leaved Cistus
 - 17——†*umbellatus* Umbellate-flowered Cistus
 - 18——†*canus* Hoary myrtle leaved trailing Cistus
 - 19——†*marifolium* Marum-leaved Cistus
 - 20——*oelandicus* Oelandian Smooth-leaved Cistus—with emarginated petals
- Note, Some of these species of Cistus, being somewhat tender, impatient of severe frost, and being desirable flowering evergreens, they are also retained in the Green-house collection; which see
- 21——†*anglicus* English Cistus, with oblong revolute hairy leaves
 - 22——†*polifolium* Polium-leaved English Cist.

CINERARIA

——*Cineraria maritima*

RAGWORT

Sea shrubby Ragwort, or Powdered Beau

CLE-

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CLEMATIS

- 1—*Clematis Viticella* [Climber] VIRGIN'S BOWER
and Traveller's Joy
[Viticella] Common Blue
Climber, or Virgin's-
Bower
—Single blue-flowered
—Purple-flowered
—Red-flowered
—Double flowered
 - 2—*Viorna* [Viorna] or Traveller's Joy,
of Virginia and Carolina
 - 3—*Vitalba* [Vitalba] Wild-Climber,
or common Traveller's
Joy of our hedges, by
road-sides, &c.
 - 4—*crispa* Curled-flowered Carolina
Virgin's-Bower
 - 5—*orientalis* Oriental Parsley-leaved Vir-
gin's-Bower
 - 6—*virginiana* Virginian three-leaved Vir-
gin's-Bower, with white
odorous flowers
 - 7—†*cirrrosa* Cirrhose-climbing simple-
leaved, Spanish Virgin's-
Bower
 - 8—*Flammula* [Flammula] Creeping flam-
mula, or pinnated and
simple-leaved Montpelier
Virgin's-Bower
 - 9—*maritima* Maritime hexangular single-
stalked Virgin's-Bower
 - 10—*erecta* Upright Clematis, with
four and five petaled flow-
ers
 - 11—*integrifolia* Intire-leaved upright Cle-
matis
- CLETHRA
- Clethra alnifolia* [Clethra]
Alder-leaved American
Clethra
—Narrow leaved
—Dwarf, broad-leaved

CNEORUM

— *Cneorum tricocon*

COLUTEA

— *Colutea arborefcens*

COMARUM

— *Comarum palufre*

CORIARIA

— *Coriaria myrtifolia*

CORNUS

1— *Cornus mas*

2— *fanguinea*

3— *alba*

4— *fericea*

5— *florida*

CORONILLA

1— *Coronilla coronata*

2— *valentina*

3— *junceæ*

4— *Emerus*

WIDOW-WAIL

Three-seeded-berried Cne-
orum or Widow-Wail

BLADDER-SENNA

Tree Colutea, or common
Bladder Senna—with ob-
verse-heart-lobed leaves

— *Common yellow-flowered*

— [*Flore fanguineo*] Blood-
red-flowered of Africa

— *Ovate intire-lobed-leav-
ed shrubby*

MARSH CINQUEFOIL

Marsh Cinquefoil

[Curriers] or MYRTLE-
LEAVED SUMACH

Myrtle-leaved Sumach

CORNEL-TREE, Cornelian
Cherry, or Dogwood

Male Cornel-tree, or Cor-
nelian Cherry

— *Red-fruited*

— *White-fruited*

Bloody-twigged European
and American Dog-wood,
or Female Cornel-tree

— *Striped-leaved*

White Newfoundland Dog-
wood

Silky-leaved Cornel-tree

Flowery, large involu-
crumed Virginia Dog-
wood

JOINTED-PODDED COLU-
TEA

Coronated, or nine-leaved,
jointed-podded Colutea

Valentian, Rue-co'oured,
nine-leaved Coronilla

Rush-shaped five and three-
leaved Coronilla

[*Emerus*] or Scorpion Senna
CORY-

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CORYLUS

1—*Corylus Avellana*

HAZEL-NUT-TREE, Filbert, &c.

[*Avellana*] or common Hazel-nut-tree

—Common small round hazel nut

—Long hazel nut

—Clustered hazel nut

—White filbert nut

—Red filbert nut

—Barcelona filbert

—Great cob nut

2—*Colurna*

[*Colurna*] or dwarf byzantine Hazel-nut-tree

3—*cornuta*

Horned, or American Cuckold nut

CRATÆGUS

Wild SERVICE-TREE

1—*Cratægus torminalis*

[Griping-fruited Sorb] Common Wild Service-berry-tree, or Maple-leaved Wild Service

2—*Aria*

[*Aria*] called White Leaf, or White Beam-tree

—*Ar. suecia*

Swedish, elliptical sinuated-leaved White Beam tree

3—*Oxyacantha*

[*Oxyacantha*] Hawthorn or Whitethorn-tree

—Common hawthorn

—Double-flowered

—Red-berried

—Scarlet-berried

—Yellow-berried

—Early flowering, called Glastonbury thorn

4—*Crus-galli*

[*Crus-galli*] or Cockspur-thorn of Virginia

—Pear-leaved

—Plum-leaved

5—*coccinea*

Scarlet-fruited Cockspur-thorn, or American Azarole

6—*Azardus*

- 6—*Azarolus* [*Azarolus*] Great European Azarole
 [Aronia] or *parsley-leaved oriental azarolus*
- 7—*tomentosa* Downy, Gooseberry-leaved Virginia Crataegus
 —*Thornless-branched*
- 8—*viridis* Green, Maple-leaved Virginia Crataegus
- CUPRESSUS CYPRESS-TREE
- 1—†*Cupressus sempervirens* Evergreen common Cypress-tree, with quadrangular branches
 —*Upright cypress*
 —*Horizontal, or spreading cypress*
- 2—†*Thyoides* [*Thyoides*] Thyoides-like Cypress, or White Cedar, with two-edged branches
- 3—†*lusitanica* Lusitanian Cypress, or Cedar of Goa
- 4—*disticha* Distichaeous or Two-ranked-leaved Deciduous Cypress
- CYTISUS [Cytisus] BASE TREFOIL
- 1—*Cytisus Laburnum* [*Laburnum*] Tree Trefoil, or Laburnum
 —*Narrow-leaved laburnum*
 —*Broad-leaved*
 —*Long-spiked*
 —*Short-flowered Scotch Laburnum*
- 2—*nigricans* Black Smooth Cytisus
- 3—*sessilifolius* Sessile-leaved, or Cytisus Secundus
- 4—†*hirsutus* Hairy Evergreen Cytisus
- 5—*supinus* Supine, or Trailing-branched Cytisus
 —*Hoary woolly-leaved*
- 6—*austriacus* Austrian Upright Cytisus
- 7—*argenteus* Silvery downy-leaved Cytisus
- 8—*glutinosus*

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8—*glutinosus*

Glutinous, or Clammy-leaved Cytisus

DAPHNE

SPURGE LAUREL, and Mezereon

1—†*Daphne Laureola*

[*Laureola*] Spurge Laurel, or *Laureola*

—*Common green-leaved*

—*Variegated-leaved*

2—*Mezereum*

[*Mezereum*] Mezereon, or Spurge Olive

—*Red-flowered mezereon*

—*Early red-flowered*

—*White-flowered*

—*Purple-flowered*

—*Autumn purple-flowered*

—*Striped-leaved*

3—*alpina*

Alpine, obtuse spear-leaved *Daphne*, downy underneath

—*Hoary-leaved*

4—*Cneorum*

[*Cneorum*] or narrow spear-leaved *Daphne*

5—*Tarton-raira*

[*Tarton-raira*] Silvery-leaved *Daphne*, or *Tarton-rair*.

6—*villosa*

Villous or Hairy-leaved *Daphne*

7—*Thymelæa*

[*Thymelæa*] or Single-stalked *Daphne*

DIOSPYROS

INDIAN DATE PLUM

1—*Diospyros Lotus*

[*Lotus*] Bastard Lotus, or Indian Date Plum; the leaves two-coloured

2—*virginiana*

Virginian Pishamin Plum, with the leaves one colour

DIRCA

LEATHER-WOOD

—*Dirca palustris*

Marsh Virginia Leatherwood

ELÆAGNUS

WILD OLIVE

1—†*Elæagnus angustifolia*

Narrow Spear-leaved *Elæagnus*

6

2—*lati-*

- 2—*latifolia* Broad ovate-leaved Elæagnus
- 3—*spinosa* Spinose, elliptical-leaved Elæagnus
- EMPETRUM CROW-BERRY
- †*Empetrum nigrum* Black-fruited, procumbent Crow-Berry, or Black-berried heath
- EPHEDRA SHRUBBY HORSE-TAIL
- 1—†*Ephedra distachya* Two-spiked Shrubby Horsetail
- 2—†*monostachya* One-spiked Shrubby Horsetail
- EPIGÆA TRAILING ARBUTUS
- †*Epigæa repens* Creeping Trailing Arbutus, —with ovate-intire leaves
- ERICA HEATH, or Heather
- 1—†*Erica vulgaris* Common opposite-leaved Heath
- Purple-flowered*
- White-flowered*
- 2—†*multiflora* Many-flowered five-leaved Heath
- 3—†*Tetralix* [*Tetralix*] called Four-leaved Heath
- 4—*cinerea* Cinereous or Ash-coloured-barked, Chaffy three-leaved Heath
- 5—*ciliaris* Ciliated hairy three-leaved Portugal Heath
- 6—*purpurascens* Purpleish procumbent Heath
- 7—†*viridi-purpurea* Green-purple Heath
- 8—†*scoparia* Beesom Montpellier Heath
- 9—*umbellata* Umbellate-flowered Portugal Heath
- 10—*arboorea* Arboresecent, or Tree-Heath
- 11—†*triflora* Three-flowered White African Heath
- 12—†*mediterranea* Mediterranean Purple Heath
- 13—†*australis* Southern cylindric-flowered Heath—with expanded leaves

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EUONYMUS

[*Euonymus*] or SPINDLE-TREE

1—*Euonymus europæus*

European common Spindle-tree, with quadrifid flowers

—*Small-leaved*

—*Broad-leaved*

—*Variegated-leaved*

—*Red capsuled*

—*White capsuled*

2—*americana*

American Evergreen Euonymus, with quinquefid flowers

—*longifolius*

—*Long-leaved*

—*verrucosus*

—*Warted*

—*atropurpurea*

—*Dark purple*

EUPHORBIA

SPURGE

—*Euphorbia amygdaloides*

Amygdalus-like, or common Wood Spurge

FAGUS

BEECH-TREE, &c.

1—*Fagus sylvatica*

Wood, or common Beech-tree—with ovate, slightly sawed leaves

—*Broad-leaved*

—*Narrow-leaved*

—*Purple-leaved*

—*Yellow-striped-leaved*

—*White-striped-leaved*

2—*Castanea*

[*Castanea*] Chestnut-tree, or Spanish Chestnut—with spear-shaped, sharply-sawed leaves

—*Common Spanish chestnut*

—*Dwarf Spanish chestnut*

—*Striped-leaved*

3—*pumila*

Dwarf American Chestnut, called Chinquapin—with spear-shaped ovate acute-sawed leaves, downy underneath

—*Variegated-leaved*

FICUS

FIG-TREE

—*Ficus Carica*

[*Carica*] or common Fig-tree;—many varieties of the

- the fruit: for which, see the arrangement of the fruit-trees
- FOTHERGILLA
1—*Fothergilla Gardeni* [*Fothergilla*]
2—*lanceolata* [*Gardeni*] or common Fothergilla
Spear-shaped-leaved Fothergilla
- FRAXINUS
1—*Fraxinus excelsior* ASH-TREE
Loftiest, or common-European Ash-tree—with sawed folioles, and flowers without petals
—*Striped-leaved*
American Ash-tree—with intire, or unsawed folioles of the leaves
—*White American ash*
—*Black American ash*
—*Carolina American ash*
3—*Ornus* [*Ornus*] or Dwarf European Ash, commonly called Flowering Ash; having flowers furnished with a corolla or petals
—*Common oblong-leaved flowering Ash*
—*Round-leaved, or Calabrian manna-ash*
- GAULTHERIA
—†*Gaultheria procumbens* EVERGREEN WHORTLE-BERRY
Procumbent Canada Gaultheria, or Evergreen Whortle-Berry
- GENISTA
1—*Genista sagittalis* DWARF-JOINTED BROOM
Arrow-shaped, Dwarf-jointed Broom
2—*candicans* Candicant Upright Genista, or Montpellier Cytisus
3—*tinctoria* Tincturous Genista, or Dyer's Broom
—*tinct. italica* —*Italian or Lucca Dyer's-broom*
Q 2 4—*florida*

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4—*florida*

Florid, or Spanish Dyer's
Broom, with silky-leaves

5—*pilosa*

Hairy Dwarf-jointed-broom

6—*purgans*

Purgative downy-leaved

7—*linifolia*

Flax-leaved oriental dwarf-
broom

8—*anglica*

English Prickly dwarf-
broom

GINKGO

JAPANESE MAIDEN HAIR-
TREE

—*Ginkgo biloba*

Bilobated Ginkgo, or Mai-
den Hair-tree of Japan;
—the leaves being narrow
below, expand considera-
rably above, dividing into
unequal parts, with both
surfaces similar, and res-
embles the leaf of the Mai-
den-hair-fern (*Adiantum*)

GLEDETISIA

THREE-THORNED ACACIA

1—*Gleditia triacanthos*

Three-thorned Virginia
Acacia

—Common, with longest
capsules

—Short oval capsuled, or
single-seeded

2—*horrida*

Horrid, or Long-thorned
Chinese Acacia

—Purple-stalked

—Green-stalked

3—*inermis*

Unarmed, or Thornless
Eastern Acacia of Java

GLYCINE

CAROLINA KIDNEY-BEAN-
TREE

1—*Glycine frutescens*

Shrubby Glycine, or Kid-
ney-Bean-tree of Caro-
lina

2—*Apios*

[*Apios americana*] Knobbed-
rooted American Liquo-
rice-Vetch, or Virginia
Kidney-Bean-tree

GULANDINA

BONDUC, or Nickar-tree

—*Gulandina*

- *Guilandina dioica* Dioecious, or Male and Female Canada Bonduc-tree
- HALESIA [*Halefia*]
 — *Halefia tetraptera* Four-Angled-fruited Carolina Halefia
 — *diptera* Two-angled-fruited Carolina Halefia
- HAMAMELIS WITCH HAZEL
 — *Hamamelis virginiana* Virginian Witch Hazel
- HEDERA IVY-TREE, or Ivy
 — † *Hedera Helix* [*Helix*] or common Evergreen Ivy
 — *Poets*, or common berry-bearing ivy
 — *Greater sterile ivy*
 — *Dwarf creeping ivy*
 — *Striped-leaved ivy*
 — *quinquefolia* Five-leaved Deciduous Ivy, or Virginia Creeper
- HIBISCUS [*Syrian Mallow*] or ALTHEA FRUTEX
 — *Hibiscus syriacus* Syrian Shrubby Mallow, or Althæa Frutex
 — *Purple-flowered*
 — *Red-flowered*
 — *White-flowered*
 — *Variegated red and white-flowered*
 — *Striped-flowered*
 — *Silver-striped-leaved*
 — *Yellow-striped-leaved*
- HIPPOPHAE SEA BUCKTHORN
 1 — *Hippophae Rhamnoides* [*Rhamnoides*] Willow-leaved Sea Buckthorn, or Rhamnoides
 2 — *canadensis* Canada, ovate-leaved Sea Buckthorn
- HYDRANGEA [*Hydrangea*]
 — *arborescens* Tree-like Virginia Hydrangea—with oblong-cordate opposite leaves

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HYPERICUM

1—*hircinum*

ST. JOHN'S WORT

Stinking common Shrubby

St. John's Wort

—*Dwarf-growing*

—*Scarlet-fruited*

2—*inodorum*

Inodorous, or Scentless St. John's Wort

3—*Androsæmum*

[*Androsæmum*] called Tut-
fan, or Park-leaves

4—*Ascyron*

[*Ascyron*] Large-flowered
Ascyron, or Siberian and
Canada St. John's Wort

5—*Olympicum*

[*Olympicum*] or Olympian
Mountain St. John's
Wort

6—*canariense*

Canary St. John's Wort

7—*kalmianum*

Kalmian's Rosemary-leaved

Virginia St. John's Wort

8—*prolificum*

Proliferous St. John's Wort

JASMINUM

JASMINE-TREE

1—*officinale*

Officinal, or common White
Jasmine

—*White striped-leaved*

—*Yellow-striped-leaved*

2—*humile*

Humble, or Dwarf Italian
Jasmine

3—*fruticans*

Shrubby Yellow Jasmine

ILEX

HOLLY-TREE

1—†*Aquifolium*

[*Aquifolium*] or common
Holly-tree; many varie-
ties: viz.

—*Common green holly*

—*Smooth, or prickly green
holly*

—*Sawed-leaved green
holly*

—*Hedgehog green holly*

—*Red-berried holly*

—*Yellow-berried holly*

—*White-berried holly*

Variegated kinds

—*White*

- | | |
|--|---|
| | <p>— <i>White blotched-leaved holly</i>
 — <i>Yellow blotched-leaved holly</i>
 — <i>Cream-coloured holly</i>
 — <i>Mottled holly</i>
 — <i>Copper-coloured holly</i>
 — <i>Hertfordshire white holly</i>
 — <i>Painted-lady holly</i>
 — <i>Chimney-sweepers holly</i>
 — <i>Milkmaid holly</i>
 — <i>Long-leaved holly</i>
 — <i>Box-leaved holly</i>
 — <i>Glory of the East holly</i>
 — <i>Glory of the West holly</i>
 — <i>Silver-edged hedgehog holly</i>
 — <i>Gold-edged hedgehog holly</i>
 — <i>Yellow-blotched hedgehog holly</i>
 2 — <i>† Cassine</i>
 [<i>Cassine</i>] or Dahoon Holly of Carolina
 — <i>Broad-leaved</i>
 — <i>Narrow-leaved</i>
 American Holly
 3 — <i>americana</i>
 I TEA
 — <i>virginica</i>
 Virginia Itca
 — <i>Greater Virginia itca</i>
 — <i>Lesser Virginia itca</i>
 — <i>Narrow-leaved</i>
 I VA
 FALSE JESUIT'S BARK-TREE
 Shrubby False Jesuit's-bark
 J UGLANS
 WALNUT-TREE
 1 — <i>regia</i>
 Royal, or common Walnut-tree;—for varieties of the fruit, see the fruit-tree division
 2 — <i>nigra</i>
 Black Virginia Walnut
 Q 4 † 3 — <i>alba</i></p> |
|--|---|

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3—*alba*

White Virginia Walnut, or
Hickery Nut

4—*cinerea*

Cinereous, or Shag-bark
American Walnut

JUNIPERUS

JUNIPER-TREE

1—†*communis*

Common Juniper

—*Tree-like common juniper*

—*Shrubby common juniper,*
with broad leaves and
long fruit

2—†*suecica*

Swedish Juniper

3—†*Oxycedrus*

[*Oxycedrus*] or greater Spa-
nish Juniper

4—†*lycia*

Lycian large-berried Juni-
per, or Cypress-leaved
Cedar

5—†*bermudiana*

Bermudian Cedar

6—†*phoenicea*

Phenician Cedar

7—†*Virginiana*

Virginian Red Cedar

8—†*thurifera*

Thuriferous, or Frankin-
cense tall Spanish Cedar

9—†*combricus*

Welsh Procumbent Juniper

10—†*Sabina*

[*Sabina*] or Savin Bush

—*Common spreading savin*

—*Upright Portugal savin*

—*Variegated-leaved sa-*
vin

KALMIA

KALMIA, or Dwarf Ame-
rican Laurel

1—†*latifolia*

Broad-leaved Maryland
Kalmia

2—†*angustifolia*

Narrow-leaved Pennsylv-
anian Kalmia

3—†*glauca*

Glaucous, or Sea-green
Shining-leaved Kalmia
of Canada

4—†*variegata*

Variegated-leaved Kalmia

LAVENDULA

LAVENDER

1—†*Spica*

[*Spica*] or common Spike-
flowering Lavender

—*Broad-leaved*

—*Narrow leaved*

2—†*Stoe-*

- † *vulg. Italicum*
 —† *vulg. latifolium*

— *Italian evergreen privet*
 — *Broad-leaved Carolina evergreen privet*

LIQUIDAMBAR

VIRGINIA STORAX-TREE,
 Liquidambar, or Sweet
 Gum

1— *Styraciflua*

[*Styraciflua*] Liquid Storax-
 tree of Virginia, or Ma-
 ple-leaved Liquidambar
 Spleenwort-leaved Canada
 Liquidambar, or Fern-
 leaved Gale

2— *asplenifoliam*

Eastern Liquidambar

3— *orientalis*

LIRIODENDRON

TULIP-TREE

— *Tulipifera*

[*Tulipifera*] Common Tu-
 lip-tree of Virginia, with
 lobated leaves

— *Carolina tulip-tree*—
 with produced large an-
 gulated leaves

LONICERA

HONEYSUCKLE — *See the last page of this division*

LOTUS

BIRD'S-FOOT TREFOIL

1— *hirsutus*

Shaggy hairy Bird's-foot
 Trefoil

2— *rectus*

Upright Smooth-podded
 Bird's-foot Trefoil

LYCIUM

BOX-THORN

1— *afrum*

African Prickly Box-thorn

2— *barbarum*

Barbary Willow-leaved
 Box-thorn

MAGNOLIA

[*Magnolia*] or LAUREL-
 LEAVED TULIP-TREE

1— *grandiflora*

Grandiflorous Evergreen
 Magnolia

— *Broad-leaved*

— *Narrow-leaved*

— *Ferrugineous or iron-
 coloured leaved*

2— *glauc*

Glaucous-leaved Lesser De-
 ciduous Magnolia

— *Double-flowered*

3— *acu-*

3—*acuminata*

Acuminated or Pointed-leaved Deciduous Magnolia

4—*tripetala*

Three-petal'd Deciduous Magnolia, or Umbrella-tree—the leaves being placed in a radius, expand like an umbrella

MENESPERMUM

MOON-SEED

1—*canadense*

Canada Moon-seed—with Target-formed, roundish-angled leaves

2—*virginicum*

Virginian Moon-seed—with targeted-lobated leaves

MESPILUS

MEDLAR-TREE

1—*germanica*

German, or Dutch Medlar:

See the fruit-tree division

—*Greater bay-leaved*

2—†*Pyracantha*

[*Pyracantha*] Italian Evergreen-thorn; commonly called *Pyracantha*

3—*arbutifolia*

Arbutus-leaved Virginia Medlar

4—*Amelanchier*

[*Amelanchier*] Helvetian Alpine Medlar; commonly called *Amelanchier*

5—*Chama-Mespilus*

[*Chama-Mespilus*] Dwarf Alpine Medlar, or Bastard Service

6—*canadensis*

Canada Snowy Mespilus

7—*Cotoneaster*

[*Cotoneaster*] Quince-leaved Pyrenean Medlar, or *Cotoneaster*

8—*rotundifolia*

Round-leaved Alpine Mespilus

9—*virginica*

Virginian Blue-berried Mespilus

—*orientales*

Oriental Medlar, or Dwarf Cherry of Mount Ida

MIMOSA

[Sensitive Plant] ACACIA

1—*pinnatifida*

Pinnatifid-leaved Acacia

Q 6

2—*ele-*

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2—*elegantissima*

Most-elegant, silky-flowered
Acacia

MORUS

MULBERRY-TREE

1—*nigra*

Black Mulberry

2—*alba*

White Mulberry

3—*rubra*

Red Mulberry

4—*patyrifera*

Paper Mulberry of Japan,
with palmated leaves.
Of the bark of this tree
the Japanese make their
paper

MYRICA

CANDLE-BERRY MYRTLE,
&c.

1—*cerifera*

Wax-berried Myrica, or
Candle-berry Myrtle.—
Of the waxy-berries is
made candles in America

—†*cer. semper-virens*

—*Evergreen candle-berry
myrtle*

2—*Gale*

[*Gale*] Sweet Gale, or
Dutch Myrtle

—*Scarlet-flowered*

MYRTUS

MYRTLE-TREE

—*communis latifolia*

Common Broad-leaved Myr-
tle

NYSSA

TUPELO-TREE

1—*aquatica*

Aquatic, or Water Tupelo-
tree of America

—*Intire-leaved*

—*Indented-leaved*

—*Many-flowered*

—*One-flowered*

2—*rotundifolia*

Roundish Shining-leaved
Tupelo-tree

OLEA

OLIVE-TREE

—†*europæa*

European Olive-tree, with
spear-shaped leaves

—*Common cultivated olive-
tree*

—*Wild olive, with leaves
hoary underneath*

—*Box-leaved olive*

ONON

ONONIS

— *fruticosa*

PASSIFLORA

— *carulea*

PERIPLOCA

— *græca*

PHILADELPHUS

1 — *coronarius*

2 — *inodorus*

3 — † *aromaticus*

PHILLYREA

1 — † *media*

2 — † *angustifolia*

— *Large-fruited Spanisb olive*

REST-HARROW

Shrubby Rest-harrow

— *Red-flowered*

— *White-flowered*

PASSION-FLOWER

Blue-rayed common Passion flower

VIRGINIA SILK

Grecian Periploca of Syria

SYRINGA, or Mock Orange

Coronated, or common

White Syringa — with somewhat indented leaves and odorous flowers

— *Single-flowered*

— *Double-flowered*

— *Variegated-leaved*

— *Dwarf-growing*

Inodorous, or Scentless

Dwarf Syringa, with intire leaves, and large white scentless flowers

Aromatic or Sweet-scented Syringa, or New-Zealand Tea-tree

PHILLYREA, or Mock Privet

Middle, or Privet-leaved Phillyrea — with ovate-lance-shaped, almost-intire leaves

— *Olive-leaved*

Narrow-leaved Phillyrea, with linear lance-shaped intire leaves

— *Rosemary-leaved*

— *Variegated-leaved*

3 — † *lati-*

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3—†*latifolia*

Broad-leaved, or True Phillyrea—with hearted egg-oval sawed leaves

—*Unfawed-leaved*

4—†*buxifolia*

Box-leaved Phillyrea

PHLOMIS

JERUSALEM SAGE

1—†*fruticosa*

Shrubby Sicilian Phlomis, or Jerusalem Sage—with roundish crenated leaves and yellow flowers

—*Broad-leaved*

—*Narrow leaved*

2—†*purpurea*

Purple-flowered—Portugal Jerusalem Sage—with hearted oblong leaves

PINUS

PINE-TREE, Fir-tree, Larch and Cedar of Lebanon

Pine kinds, distinguished from the firs by the leaves being produced in pairs, threes, fives, and many together from the same point; the fir-tree leaves all standing singly

1—†*sylvestris*

Wild Pine, or Pinaster, and Scotch Pine; leaves in pairs, the first ones singly

—*Broad-leaved or pinaster*

—*Short-leaved, or Scotch pine*; sometimes erroneously called Scotch fir

—*Dwarf pinaster*

2—†*Pinea*

[*Pinea*] Italian Stone Pine—long leaves in pairs; the first ones singly and ciliated, and large roundish close hard cones

3—†*Tæda*

[*Tæda*] Torch, or Frankincense Virginia Pine; long leaves by threes

4—†*Cembra*

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- 4——† *Cembra* [*Cembra*] or Siberian Stone Pine; *Smooth leaves by fives*
- 5——† *Strobus* [*Strobus*] New-England, or Weymouth Pine; *smooth bark, and rough-edged leaves by fives*
- 6——† *Cedrus* [*Cedrus*] Cedar of Lebanon; *acute leaves, many together in a bundle from the same point: and large top-shaped close cones*
- 7—— *Larix* [*Larix*] Larch-tree, or Deciduous Pine; *obtuse leaves, many together in a bundle, from the same point*
 - Red larch
 - White larch
 - Black larch
 - Dwarf alpine larch
 - Chinese, or Siberian larch
- Lar. chinensis* Fir kinds; having the leaves standing singly and distinct
- 8——† *Abies* [*Abies*] Common Norway Spruce Fir-tree; *leaves awl-shaped, pointed, polished and ranged two ways*
 - Red Norway fir
 - White Norway fir
- 9——† *Picea* [*Picea*] Pitch-tree, or Silver Fir; *leaves emarginated at the apex or top, and silvery underneath, and very long cones*
- 10——† *Balsamea* [*Balsamea*] Balsamic, or Balm of Gilead Fir; *broad leaves disposed like the*

the teeth of a comb, somewhat emarginated at top with whitish lines underneath

11—†*Canadensis*

Canada Spruce Fir, leaves linear, obtuse and somewhat membranous

—White Canada spruce fir

—Red Canada spruce fir

—Black Canada spruce fir

The following pines and fir kinds, not being in the Linnæan arrangements, as being probably varieties of some or other of the foregoing species, are known in the Nurseries by these names

12—†*virginiana*

Virginian, or New-Jersey Pine

13—†*palustris*

Marsh or Swamp Virginia Pine

14—†*balpenfis*

Aleppo Pine

15—†*americana*

American Hemlock Spruce Fir

PISTACIA.

PISTACIA NUT, or Turpentine-tree

1—*vera*

True Pistacia Nut-tree

2—*Terebinthus*

[*Terebinthus*] or Turpentine-tree

3—*trifolia*

Three-leaved Turpentine-tree

PLANTAGO.

PLANTAIN

—*cynops*

Shrubby Plantain

PLATANUS

PLANE-TREE

1—*orientalis*

Oriental or True Eastern Plane-tree, with broad palmated leaves

2—*occidental*

Occidental, or Western Plane-tree of America, with lobated leaves

3—*bif-*

- 3—*hispanica* Spanish, or Middle Plane-tree
- POPULUS POPLAR-TREE
- 1—*alba* White Poplar, or Abele-tree
- Large-leaved*
- Small-leaved*
- Cut-leaved*
- 2—*tremula* Trembling Poplar, or Aspen-tree
- 3—*nigra* Black Poplar-tree
- 4—*balsamifera* Balsamic American Poplar
- Greater sub-heart-leaved*
- Lesser oblong-leaved, or tacamahacca tree*
- Variegated-leaved*
- The buds and leaves furnishing a balsamic juice, most excellent for curing all green or fresh wounds
- 5—*heterophylla* Variable-leaved Virginia Poplar
- 6—*paduensis* Po, or Lombardy pyramidal Poplar, a very swift grower
- 7—*carolinensis* Carolina Poplar
- 8—*canadensis* Canada Poplar
- 9—*cordifolia* Heart-leaved Poplar
- POTENTILLA CINQUEFOIL
- fruticosa* Shrubby Cinquefoil
- PRINOS WINTER-BERRY
- 1—*verticillatus* Verticilled Winter-Berry, with leaves longitudinally sawed
- 2—†*glaber* Smooth-leaved evergreen Winter-Berry, Yappon, or South Sea Tea-shrub, leaves sawed at the top
- PRUNUS PRUNE, or Plum-tree; Cherry, Apricot and Laurel, &c.
- 1—*domestica*

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- 1—*domestica* Domestic, or common plum-tree; many varieties of the fruit.—See the fruit-tree division.
 - Silver-blotched-leaved*
 - Gold-blotched-leaved*
 - Double-flowered*
 - [Damascena]* or *Damson-tree*
 - Double-flowered damson*
- 2—*insititia* Insititious Wild Plum, or Bullace-tree
- 3—*spinosa* Thorny Wild Plum, Blackthorn, or Sloe tree
- 4—*Cerasus* [*Cerasus*] or Cherry-tree; many varieties of the fruit.—See the fruit-tree division.
 - Double-flowered*, most beautiful
- 5—*avium* Bird, or Great Wild Cherry-tree
 - Black-fruited*
 - Red-fruited*
 - Large black*, or *Coroune cherry*
- 6—*Padus* [*Padus*] or common European Bird Cherry
- 7—*†virginiana* Virginia Bird Cherry
- 8—*canadensis* Canada Bird Cherry
 - stricta*
 - nigra*
- 9—*Mahaleb* [*Mahaleb*] or Perfumed Cherry
- 10—*Armeniaca* [*Armeniaca*] or Apricot-tree; many varieties of the fruit.—See the fruit-tree division.
 - Striped-leaved*

- 11———*siberica* Siberian Apricot-tree, with
egg-oblong leaves
- 12———†*Lauro-Cerasus* [*Lauro-Cerasus*] Cherry-
Laurel, or common Lau-
rel-tree
———*Broad-leaved*
———*Narrow-leaved*
———*Silver-striped-leaved*
———*Gold-striped-leaved*
- 13———†*lusitanica* Portugal Laurel
PTELEA SHRUB TREFOIL
———*trifoliata* Trifoliate Shrubby Trefoil
of Virginia
- PUNICA POMEGRANATE-TREE
1———*Granatum* [*Granatum*] or Common
Pomegranate-tree
———*Double-flowered*
2———*nana* Dwarf Pomegranate-tree
———*Double-flowered*
- PYROLA WINTER-GREEN
1———*umbellata* Umbel-flowering Winter-
green
2———*maculata* Spotted Winter-green
3———*secunda* One-sided flowering Winter-
green
- PYRUS PEAR-TREE, Apple and
Quince, &c.
1———*communis* Common Pear-tree; many
varieties of the fruit.—
See the fruit-tree division
———*Variegated-leaved*
———*Double-flowered*
———*Twice-flowering*
2———*Malus* [*Malus*] Apple-tree; many
varieties of the fruit.—
See the fruit-tree division
———*Double-flowered*
———*Fugaceous-flowered, or*
fig-apple
———*Two years apple*
3———*coro-*

	—Paradise apple
	—Wild apple or crab
3—coronaria	Coronated, or sweet-scented Crab of Virginia
4—†cor. sempervirens	Evergreen sweet-scented Crab
5—baccata	Berry-fruited Siberian Crab
6—Cydonia	[Cydonia] or Quince-tree
	—Greater quince
	—Lesser quince
	—Apple-fruited quince
	—Pear-shaped quince
QUERCUS	OAK-TREE
1—Robur	[Robur] Common English Oak
	—Silver-striped-leaved
	—Gold-striped-leaved
2—alba	White Virginia Oak
3—rubra	Red Virginia Oak
4—nigra	Black American Oak
5—Phellos	[Phellos] or Willow-leaved American Oak
	—Long intire-leaved
	—Oblong-leaved
	—Dwarf-growing, short- leaved
	—Variable-leaved
6—Ægilops	[Ægilops] or Prickly-cup'd Spanish Oak
7—Esculus	[Esculus] Pinnatifid cut- leaved South European Oak
8—Prinus	[Prinus] Chesnut-leaved American Oak
9—Cerris	[Cerris] Lyrated-leaved Turkey Oak
10—montana	Mountain Oak
11—humilis	Humble-growing American Oak
12—Ilex	[Ilex] Common Evergreen Oak
	11—†gra-

- 13——†*gramuntia* ——— *Long-leaved*
 ——— *Short-leaved*
 ——— *Narrow-leaved*
 14——†*Coccifera* Holly-leaved Montpelier
 Oak
 15——†*Suber* [*Coccifera*] Scarlet-bearing
 Kermes Oak
 [*Suber*] or Cork-tree
 ——— *Broad-leaved*
 ——— *Narrow-leaved*
 16——†*carolinensis* Carolina Live Oak
 17——†*exoniensis* Exonian or Exeter Ever-
 green Oak
 18——*lusitanica* Portugal Algava Oak
 RHAMNUS BUCKTHORN, *Frangula*
 and *Alaternus*, &c.
 Spinese kinds
 v——*catharticus* Cathartic, or Common
 Purging Buckthorn
 2——*lycioides* Lycium-like Dwarf Spanish
 Buckthorn
 3——*Oleoides* [*Oleoides*] or Olive-leaved
 Spanish Buckthorn
 Without thorns
 4——*Frangula* [*Frangula*] Common Fran-
 gula, or Berry-bearing
 Alder
 5——*alpina* Alpine large-leaved Fran-
 gula
 6——*lineatus* Lineated-leaved China Rha-
 mnus, called Supple-Jack
 7——†*Alaternus* [*Alaternus*] Common Ala-
 ternus, or Evergreen Privet
 ——— *Sawed-leaved*
 ——— *Jagged-leaved*
 ——— *Gold-blotched-leaved*
 ——— *Silver-striped-leaved*
 ——— *Gold-striped-leaved*
 Prickly branched
 8——*Paliurus* [*Paliurus*] Round-leaved
 South European Rham-
 nus, called Christ's Thorn
 RHOD-

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RHODODENDRON

1——†*maximum*

2——†*ponticum*

3——†*ferrugineum*

4——†*hirsutum*

RHODORA *canadensis*

RHUS

1——*Coriaria*

2——*typhinum*

3——*glabrum*

4——*Copallinum*

5——*Cotinus*

6——*Metopium*

7——*Toxicodendron*

8——*radicans*

DWARF ROSE BAY

Greater American Rhododendron—with oval shining leaves

——*White-flowered*

——*Red-flowered*

Pontic Laurel-leaved Rhododendron—with purple flowers

Iron-coloured, or Scurfy-leaved Alpine Rhododendron—with rose-coloured flowers

——*Striped-leaved*

Shaggy, or Hairy-leaved Dwarf Rose Bay—with funnel-shaped flowers

CANADA ROSE BAY

SUMACH-TREE, Poison-tree, &c.

[*Coriaria*] or Tanner's Sumach

Typhinous Virginia Rhus, or Stag's-horn Sumach

Smooth American Rhus, or Scarlet Sumach

[*Copallinum*] Lentiscus-leaved American Sumach

[*Cotinus*] Venetian Sumach—with simple ob-ovate leaves

[*Metopium*] Five-leaved American Rhus

[*Toxicodendron*] or Poison-tree of America—with radicant or rooting stalks and downy leaves

Radicant, or Rooting-stalked Virginia Poison-tree—with naked leaves

9——*Ver-*

- 9—*Vernix* [*Vernix*] True Varnish-tree
of America and Japan, or
Poison Ash, or Poison-
wood-tree
- 10—*sinensis* Chinese Lac-tree
- 11—*succedanea* Succedaneous or Spurious
Varnish-tree of China
and Japan
- RIBES CURRANT and GOOSE-
BERRY-TREE
- 1—*rubrum* Red Currant-tree
—*rub. alba* —White currant
—Striped-leaved
—Gooseberry-leaved
- 2—*nigrum* Black Currant-tree
—*Pennsylvanian* black
currant
- 3—*alpinum* Alpine upright-flowered
Currant
- 4—*Grossularia* [*Grossularia*] or Gooseberry-
tree—with hairy fruit
—Hairy red-berried, in
varieties.
—Hairy green-berried, in
varieties
- 5—*Uva-crispa* [*Uva-crispa*] or Smooth-
fruited gooseberry,—
many varieties of the fruit
- 6—*reclinatum* Reclining-branched goose-
berry-tree
- 7—*cynosbati* Briary, or Prickly-fruited
Canada Gooseberry
- 8—*oxyacanthoides* Hawthorn-leaved Canada
Gooseberry
- 9—*diacantha* Two-thorned Gooseberry-
tree
- ROBINIA FALSE ACACIA, &c.
- 1—*Pseudo-Acacia* [*Pseudo-Acacia*] or Com-
mon False Acacia
—*Pseud. Aca. hispida* —Hisped-stalked, rose-
flowered, or scarlet false
acacia
- 2—Car-

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- | | |
|---------------------------|--|
| 2— <i>Caragana</i> | [<i>Caragana</i>] or Abrupt-pin-
nated-leaved Siberian Ro-
binia |
| 3— <i>frutescens</i> | Shrubby Quaternate-leaved
Siberian Robinia—with
a yellow bark |
| 4— <i>pygmæa</i> | Dwarf Quaternate-seffile-
leaved Siberian Robinia |
| ROSA | |
| 1— <i>alpina</i> | ROSE-TREE, &c.
Alpine Spineless Rose |
| 2— <i>pimpinellifolia</i> | Pimpinella-leaved, or Bur-
net-leaved Rose |
| 3— <i>spinossissima</i> | Mott-spinous, or Scotch Rose
—Red-flowered
—White-flowered
—Yellow-flowered
—Marbled-flowered
—Double red-flowered |
| 4— <i>Eglanteria</i> | [<i>Eglanteria</i>] Sweet-Briar,
or Eglantine Rose
—Common sweet-briar
—Mossy sweet-briar
—Double-flowered
—Double blush-flowered
—Striped-leaved
—†Evergreen sweet-briar |
| 5— <i>cinnamomea</i> | Cinnamon Rose
—Single-flowered
—Double-flowered |
| 6— <i>carolinensis</i> | Carolina Rose |
| 7— <i>villosa</i> | Villous-leaved, or Apple-
bearing Rose
—Single-flowered
—Double-flowered |
| 8— <i>centifolia</i> | Hundred-leaved Rose
—Dutch hundred-leaved
—British hundred-leaved
—Pompon hundred-leaved
—Blush hundred-leaved |
| 9— <i>gallica</i> | Gallican, or Official Red
Rose
— <i>gal.</i> |

- gall. versicolor*
- 10 — *†sempervirens* Evergreen Rose
 11 — *canina* Dog, or Wild Red Rose
 12 — *arvensis* Field White Dog Rose
 — *Red-flowered*
 — *Striped-leaved*
 13 — *†indica* Indian, or Chinese quinate-leaved Evergreen Rose
 14 — *pendula* Pendulous-fruited, Burnet-leaved Rose
 15 — *alba* Common White Rose
 — *Single-flowered*
 — *Double-flowered*
 — *Maiden's blush*
 — *Large royal double*
 The following not being in the Linnæan arrangements of the species plantarum; but many of them are supposed varieties of the foregoing species, are known in the Nurseries by the following names:
 16 — *germanica* German or Frankfort Purple Rose
 17 — *belgica* Belgic, or Dutch Rose
 — *Red-flowered*
 — *Incarnate, or blush-flowered*
 — *Great royal*
 18 — *provincialis* Provence, or common Red Rose
 — *Double-flowered*
 — *Greater double, or cabbage rose*
 — *Childing-flowered*
 R — *prov.*

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- | | |
|-------------------|---|
| | —Blush-flowered, or imperial provence rose |
| —prov. muscosa | —White flowered |
| | —Moss provence rose |
| 19—holoserica | —Striped-leaved Velvet Rose |
| | —Double flowered |
| 20—damascena | —Semi-double-flowered Damask Rose |
| | —Red flowered |
| | —Double-flowered |
| | —White flowered |
| | —Blush-coloured |
| | —Party-coloured, or York and Lancaster rose |
| 21—marmorea | Marbled Rose |
| | —Semi-double-flowered |
| | —Full double-flowered |
| 22—incarnata | Incarnate-coloured-flowered, or Maiden's Blush Rose |
| | |
| 23—burgundensis | Burgundy Red Rose |
| | —Blush-red-flowered |
| | —Grimson-flowered |
| 24—inermis | Inermous, Unarmed, or Thornless Rose |
| | |
| 25—lutea | Yellow Rose |
| | —Single-flowered |
| | —Double-flowered |
| | —Yellow Austrian |
| —lut. bicolor | —Two-coloured, or red and yellow Austrian rose |
| 26—menstrualis | Monthly Rose |
| | —Blush flowered |
| | —White-flowered |
| | —Striped-flowered |
| 27—moschata | Musk Rose |
| | —Single-flowered |
| | —Double-flowered |
| 28—pennsylvanicum | Pennsylvanian Rose |
| | —Double-flowered |
| | 29—port- |

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- | | | |
|-----|----------------------|--|
| 29— | <i>portlandia</i> | Portland monthly Crimfon
Rose |
| 30— | [<i>De Meux</i>] | Rose de Meux, or Small
Blush French Rose |
| 31— | <i>stebonensis</i> | Stebon, or Stepney Rose |
| 32— | <i>francois</i> | St. Frances's Rose |
| 33— | <i>hispanica</i> | Spanish Rose |
| 34— | <i>sanguinea</i> | Bloody, or Red-stalked
American Rose |
| 35— | <i>regia</i> | Royal Rose |
| | ROSMARINUS | ROSEMARY |
| | — <i>officinalis</i> | Officinal, or common Rose-
mary |
| | | — <i>Narrow-leaved</i> |
| | | — <i>Broad-leaved</i> |
| | | — <i>Silver-striped-leaved</i> |
| | | — <i>Gold-striped leaved</i> |
| | RUBUS | BRAMBLE and RASPBERRY |
| 1— | <i>fruticosus</i> | Shrubby Rubus, or common
Bramble |
| | | — <i>Common black-berried</i> |
| | | — <i>Double-flowered</i> |
| | | — <i>White-berried</i> |
| | | — <i>Smooth, or prickly-
stalked</i> |
| 2— | <i>idaeus</i> | [<i>Rubus of Mount Ida</i>] or
common Raspberry |
| | | — <i>Red-berried</i> |
| | | — <i>White berried</i> |
| | | — <i>Black-berried</i> |
| | | — <i>Double flowered</i> |
| | | — <i>Twice-flowering</i> |
| | | — <i>Prickly-stalked</i> |
| | | — <i>Smooth-stalked</i> |
| 3— | <i>hispidus</i> | Hispid-stalked ternate leav-
ed Canada Raspberry |
| 4— | <i>odoratus</i> | Odorous flowered, or flower-
ing Virginia Raspberry |
| 5— | <i>canadensis</i> | Canada smooth-stalked,
fingered-leaved Raspberry |
| 6— | <i>cæsius</i> | Grey-fruited dwarf Bram-
ble, or Dew-berry |
| | | R 2 7— <i>occid.</i> |

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- | | |
|------------------------|--|
| 7— <i>occidentalis</i> | Occidental blue-stalked Canada Raspberry—with leaves downy underneath |
| 8— <i>Chamæmorus</i> | [<i>Chamæmorus</i>] Dwarf Mulberry, or Cloud-berry |
| 9— <i>saxatilis</i> | Saxatile, or Rock Bramble—with leaves having wirey runners |
| 10— <i>japanicus</i> | Japan shrubby Bramble—without spines |
| RUSCUS | BUTCHER'S BROOM, or Knee Holly |
| 1—† <i>aculeatus</i> | Prickly common Butcher's Broom—bearing flowers on the upper-side of the leaves |
| 2—† <i>Hypophyllum</i> | [<i>Hypophyllum</i>] Broad leaved Ruscus, or Alexandrian dwarf Wood Laurel—leaves bearing flowers underneath |
| 3—† <i>Hypoglossum</i> | [<i>Hypoglossum</i>] Tongue upon Tongue-leaved Ruscus—leaves bearing flowers, and a small leaf on the upper side |
| 4—† <i>Androgynus</i> | [<i>Androgynus</i>] Androgynous Broad-leaved Canary Ruscus—bearing flowers on the margin of the leaves |
| 5—† <i>racemosa</i> | Racemose-flowering Hermaphrodite Ruscus |
| RUTA | RUE-TREE |
| 1—† <i>graveolens</i> | [Strong-scented] or common Rue |
| | — <i>Broad-leaved</i> |
| | — <i>Small-leaved of Aleppo</i> |
| | — <i>Striped-leaved</i> |
| 2—† <i>linifolia</i> | Flax-leaved Spanish Rue |
| 3— <i>patavina</i> | Patavian Bastard Rue |
| | 4— <i>pin-</i> |

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4— <i>pinnata</i>	Pinnated-leaved Rue
SALICORNIA	JOINTED GLASSWORT
—+ <i>fruticosa</i>	or Saltwort
	Shrubby Evergreen Sea
	Glasswort
SALIX	SALLOW or WILLOW-TREE
1— <i>hermaphrodita</i>	Hermaphrodite-flowered
	shining-leaved Willow
2— <i>triandra</i>	Triandrious-flowered, white
	barked Willow — with
	shining leaves
3— <i>pentandra</i>	Pentandrious-flowered Odo-
	riferous Willow
4— <i>phylicifolia</i>	Phylica-leaved Swedish
	Willow
5— <i>vitellina</i>	Vitellinous, or Yellow-
	twigged Willow
6— <i>amygdalina</i>	Almond-leaved Willow
7— <i>hastata</i>	Hastated or Halbert-leaved
	Lapland Willow
8— <i>fragilis</i>	Fragile or Brittle Willow
9— <i>babylonica</i>	Babylonian Pendulous-
	branched Salix, called
	Weeping-Willow
10— <i>reticulata</i>	Netted roundish-leaved
	Willow
11— <i>purpurea</i>	Purple twigged or Norfolk
	Red Willow
12— <i>Helix</i>	[<i>Helix of Theophrasti</i>] or
	Dwarf Yellow Willow
13— <i>rosmarinifolia</i>	Rosemary leaved Willow
14— <i>alba</i>	White Willow
15— <i>rubra</i>	Red Willow
16— <i>fusca</i>	Brown Willow
17— <i>arenaria</i>	Sand Willow
18— <i>lanata</i>	Woolly-leaved Lapland
	Willow
19— <i>aurita</i>	Aurited or eared round-
	leaved Willow
20— <i>glauca</i>	Glaucous or Sea-green
	leaved Lapland Willow
	R 3
	21— <i>vimi-</i>

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21—	<i>viminalis</i>	Twiggy or Osier Willow
22—	<i>lappoxum</i>	Lapland Hairy-leaved Willow
23—	<i>myrsinites</i>	Dwarf Spurge-like Lapland Willow
24—	<i>arbuscula</i>	Little under-shrubby Lapland Willow
25—	<i>myrtilloides</i>	Myrtillus-like Swedish Willow
26—	<i>repens</i>	Creeping, rooting-stalked Dwarf Swedish Willow
27—	<i>incubacea</i>	[Incubaceous] Procumbent-branched Dwarf Willow
28—	<i>caprea</i>	Caprean, round rough-leaved Willow, or common Sallow-tree
		— <i>Striped-leaved fallow</i>
SALSOLA		GLASSWORT.
—	<i>fruticosa</i>	Shrubby Thread-form-leaved Glasswort
SALVIA		SAGE
—	<i>officinalis</i>	Officinal or common under-shrubby Sage — several varieties
		— <i>Green broad-leaved, or balsamic tea sage</i>
		— <i>Striped-leaved green sage</i>
		— <i>Red-leaved, or common culinary sage</i>
		— <i>Striped red sage</i>
		— <i>Lesser narrow-leaved sage, called sage of virtue</i>
		— <i>Broad woolly-leaved sage</i>
SAMBUCUS		ELDER-TREE
1—	<i>nigra</i>	Black-berried, or common Elder-tree
		— <i>Common black-berried</i>
		— <i>White-berried</i>
		2— <i>ca-</i>

- 2 — *canadensis* — *Laciniated, or parsley-leaved*
 3 — *racemosa* — *Silver striped-leaved*
 — *Gold striped-leaved*
 — *Silver-dusted-leaved*
 Canada shrubby Elder —
 with almost doubly-pin-
 nated leaves
 3 — *racemosa* — *Racemose-flowering, or red-
 berried Elder-tree*
 SANTOLINA — *LAVENDER-COTTON*
 1 — † *ChamæCyparissus* [*ChamæCyparissus*] Dwarf
 Cypress, or common La-
 vander Cotton — with
 leaves ranging four ways
 2 — † *rosmarinifolia* — *Rosemary-leaved Spanish
 Lavender Cotton—with
 linear leaves.*
 — *Greater*
 — *Lesser*
 — *Green-leaved*
 — *Hoary-leaved*
 SATUREJA — *SAVORY*
 — † *montana* — *Mountain, or Winter Sa-
 vory*
 SIDEROXYLON — *IRON WOOD*
 — *lycioides* — *Lycium-like, or thorny
 Canada Iron Wood*
 SMILAX — *SMILAX, or ROUGH BIND-
 WEED*
 1 — *aspera* — *Rough, most prickly Smi-
 lax, or common rough
 Bindweed*
 2 — *excelsa* — *High-climbing Syrian rough
 Bindweed*
 3 — *Sarsaparilla* [*Sarsaparilla*] Ivy-leaved
 Peruvian Smilax, called
Sarsaparilla
 4 — *laurifolia* — *Bay-leaved Canada Smilax*
 5 — *rotundifolia* — *Round-leaved Canada Smi-
 lax*
 R 4. 6 — *tam-*

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6—*tamnoides*

Tamnus-like, or Black-bri-
ony-leaved Carolina Smi-
lax

7—*Cbina*

[*Cbina radix*] China-root,
or Five-nerved-leaved
rough Bindweed

SOLANUM

NIGHTSHADE

—*Dulcamara*

[*Dulcamara*] Bitter-sweet,
or shrubby Nightshade of
the Woods and Hedges

—*Common green-leaved*

—*Striped-leaved*

SORBUS

SORB, or TRUE SERVICE-
TREE

1—*domestica*

Domestic, or True Culti-
vated Service-berry-tree

—*Apple shaped*

—*Pear-shaped*

2—*acuparia*

[Catch-Bird Wild Sorbus]
commonly called Moun-
tain Ash or Roan-tree

3—*hybrida*

Mongrel, downy-leaved
Service

SPARTIUM

BROOM

1—*juncum*

Rushy-twiggèd, or Spanish
Broom

—*Common single-flowered*

—*Double-flowered*

2—*monospermum*

Single-seeded Spanish
Broom

—*White-flowered*

—*Yellow-flowered*

3—*radiatum*

Radiated, or Starry Italian
Broom

4—*Scorpius*

[*Scorpius*] Greater spread-
ing-spined Spanish Broom

5—*scoparium*

Sweeping, or common Be-
som Broom

—*Yellow-flowered*

—*White-flowered*

6—*striatum*

Striated, or fluted Broom

SPI-

SPIRÆA

- 1—*salicifolia*
- 2—*tomentosa*
- 3—*hypericifolia*
- 4—*crenata*
- 5—*chamædrifolia*
- 6—*opulifolia*
- 7—*sorbifolia*
- 8—*argentea*
- 9—*japonica*

STAPHYLEA

- 1—*pinnata*
- 2—*trifolia*

STEWARTIA

- Malacondendron*

STYRAX

- 1—*officinale*
- 2—*grandifolium*

SYRINGA

- 1—*vulgaris*
- vul. scotica*

SPIRÆA FRUTEX

- Willow-leaved Scarlet Spiræa
- Downy-leaved Scarlet Spiræa
- Hypericum-leaved Spiræa, or hypericum Frutex
- Crenated or notched-leaved white-flowering Spiræa
- Germander-leaved Spiræa
- Opulus or Gelder-rose-leaved Spiræa
- Sorbus-leaved Spiræa
- Silvery-leaved Spiræa
- Japan downy-stalked Spiræa

BLADDER NUT

- Pinnated five-leaved European Bladder-nut
- Three-leaved Virginia Bladder Nut

STEWARTIA

- [*Malacondendron*] or Virginia Stewartia—with large white flowers
- Broad-leaved with red foot-stalks*
- Broad-leaved with green foot-stalks*

STYRAX, or True STORAX-TREE

- Officinal Syrian Storax-tree
- Large-leaved Storax-tree

LILAC

- Common Lilac—with ovate heart-shaped leaves
- Common blue-flowered*
- Purple-flowered*
- White-flowered*
- Scotch lilac*
- Striped-leaved*

R 5

2—*persica*

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2—*persica*

Persian Lilac—with lance-shaped intire leaves, or Babylonian Syringa

—*Blue-flowered*

—*White-flowered*

—*Laciniated, or cut-leaved*

—*pers. laciniata*

TAMARIX

TAMARISK-TREE

1—*gallica*

French Tamarisk-tree—with pentandrious flowers and small leaves

2—*germanica*

German shrubby Tamarisk—with decandrious flowers and thick leaves

TAXUS

YEW-TREE

1—†*baccata*

Berry-bearing, or common Yew-tree

2—*nucifera*

Nut-bearing Japanese Yew-tree

TEUCRIUM

TREE GERMANDER

1—*flavum*

[Straw-coloured] or common Tree Germander

—*Pale-flowered*

—*Shining-leaved purple-flowered*

2—*fruticans*

Shrubby Tree Germander

3—*massilienses*

Marseilles upright Tree Germander

4—*Marum*

[*Marum*] Syrian Mastick, or Marum

THEA

TEA-TREE

1—*bohea*

Bohea Tea-tree—with flowers having six petals

2—*viridis*

Green Tea-tree—with flowers having nine petals

THUJA

ARBOR-VITÆ, or Tree of Life

1—†*occidentalis*

Occidental or American Arbor-Vitæ—with dark-green leaves

—*Variegated-leaved*

—*Sweet-scented*

2—†*ori-*

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2——†*orientalis*

Oriental, or Chinese Arbor-Vitæ—with light-green leaves

THYMUS

THYME

1——†*vulgaris*

Common upright Thyme

——*Small-leaved*

——*Broad-leaved*

——*Variegated-leaved*

2——†*cephalotus*

Headed-flowered Portugal Thyme

——*Greater-headed*

——*Lesser-headed*

——*Striped-leaved*

3——†*Zigis*

[*Zigis*] Narrow-leaved upright Thyme—with linear ciliated leaves

4——†*Mastichina*

[*Mastichina*] or Mastich Thyme—with woolly spikes

5——†*Serpyllum*

[*Serpyllum*] Creeping Wild Thyme—commonly called mother of thyme

——*Greater, mother of thyme*

——*Lesser, with woolly heads*

——*Broad-leaved*

——*Narrow-leaved*

——*Silver-striped-leaved*

——*Lemon-scented, or lemon thyme*

——*Hairy-leaved*

TILIA

LIME-TREE, or Linden

1——*europæa*

European, or common Green-barked Lime-tree

——*Green-twigged*

——*Red-twigged*

——*Broad-leaved*

——*Small-leaved*

——*Striped-leaved*

2——*americana*

American large smooth-leaved lime-tree

R 6

3——*cara*

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3—*carolinienfis*

Carolina large-leaved
woolly Lime-tree

VACCINUM

BILBERRY or WHOR-
TLE-BERRY

1—*Myrtillus*

[*Myrtillus*] Angular-
stalked Vaccinum, Bil-
berry, or Black Whorts

2—*uliginosum*

Marsh-growing, or great
Bilberry

3—*album*

White Pennsylvanian
Bilberry

4—†*Oxycoccus*

[*Oxycoccus*] Cranberry,
or Moorberry — with
thread-form creeping
stalks

—*Oxy. majus*

—Greater American
Cranberry

5—†*Vitis idæa*

[*Vitis idæa*] Vine of
Idea, or greater Red
Whorts

6—†*mucronatum*

—Lesser red whorts
Daggered-leaved Ame-
rican Vaccinum

7—*corymbosum*

Corymbus-flowering A-
merican Vaccinum

8—*frondosum*

Frondose, or leafy-spik-
ed American Vacci-
num

9—*stamineum*

Stamineous, or long-
stamened American
Vaccinum

10—*ligustrinum*

Privet-leaved shrubby
Pennsylvanian Vacci-
num

11—†*bispidulum*

Hispid, creeping stalked
American Vaccinum

12—*amoenum*

Delicate variegated flow-
ered Vaccinum

VIBURNUM

PLIANT MEALY-TREE,
or Wayfaring-tree, and
Laurustinus, &c.

1—*Lan-*

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- 1—*Lantana* [*Lantana*] or common Way-faring-tree
——*Broad-leaved*
——*Narrow-leaved*
——*Variegated-leaved*
 - 2—*acerifolium* Maple-leaved Viburnum, or Virginia Guelder Rose
 - 3—*Opulus* [*Opulus*] Common Guelder Rose, or Marsh Elder
——*Single-flowered*
——*Double-flowered*
——*Striped-leaved*
 - 4—*Lentago* [*Lentago*] Canada thick-leaved Viburnum
 - 5—*nudum* Naked umbelled Virginia Viburnum
 - 6—*dentato* Dentated, or toothed-leaved Virginia Viburnum
 - 7—*prunifolium* Plum-leaved Virginia, and Canada Viburnum
 - 8—*scandens* Climbing, large-flowered Viburnum
 - 9—*pyrifolium* Pear-leaved Viburnum
 - 10—†*Tinus* [*Tinus*] Laurustinus, or Wild Bay
——*Common ovate intire-leaved*
——*Narrow-leaved*
——*Broad-leaved*
——*Shining-leaved*
——*Hairy-leaved*
——*Silver-striped-leaved*
——*Gold-striped-leaved*
 - 11—*Tinoides* [*Tinoides*] Tinus-like elliptical-leaved Viburnum
 - 12—*Cassinoides* [*Cassinoides*] Cassine-like American Viburnum, called Cassio-berry-bush
- VINCA
1—*miuor* PERIWINKLE
Minor, or lesser procumbent Periwinkle
2—†*major*

- *Silver-striped-leaved*
- *Gold-striped-leaved*
- *White-flowered*
- *Blue-flowered*
- *Purple-flowered*
- *Double-flowered*
- 2 — *†major* Major, or greater upright Periwinkle
- 3 — *†lutea* Yellow Carolina Periwinkle
- VISCUM MISSELTOW
- *†album* White Misseltow
- VITEX CHASTE-TREE, or Agnus Castus
- *Agnus Castus* [*Agnus Castus*] Common Chaste-tree, or Agnus Castus
- *Narrow-leaved*
- *Broad-leaved*
- VITIS VINE, or Grape-tree
- 1 — *vinifera* [Wine-bearing] or common Grape-vine—many varieties of the fruit. See the fruit-tree division
- *Common lobated-leaved*
- *Smooth-leaved*
- *Hoary-leaved*
- *Cut-leaved*
- *Striped-leaved*
- 2 — *vulpina* Fox Grape of Virginia
- 3 — *laciniosa* Lacinated, or jagged-leaved Vine
- 4 — *†arborea* Arboresecent, or Pinnated-leaved Carolina Vine
- ULEX FURZE, Whins, or Gorse
- *europæus* European, or common Furze
- *Yellow-flowered*
- *White-flowered*
- *Dwarf-growing*
- ULMUS

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ULMUS

1—*campestris*

—*camp. belgica*

—*camp. glabra*

2—*americana*

3—*pumila*

YUCCA

1—†*gloriosa*

2—†*filamentosa*

ELM-TREE

Field, or common Elm-tree
— with doubly-sawed
leaves, unequal at the
base

—Common rough-leaved
English elm

—Narrow-leaved

—Broad-leaved

—Silver-striped-leaved

—Gold-striped-leaved

—Dutch elm, with a
rough spongy bark

—Broad-leaved Dutch elm

—Narrow-leaved Dutch
elm

—Striped-leaved Dutch
elm

—Smooth-barked, or wych
elm, with oblong leaves

—Broad-leaved wych elm

—Striped-leaved wych
elm

American Elm—with sing-
ly-sawed leaves, unequal
at the base

—Smooth-leaved

—Rough-leaved

Dwarf Siberian Elm—with
equally sawed leaves,
equal at the base

YUCCA, or ADAM'S NEE- DLE

Gloriose Canada Yucca, or
common Adam's Needle
—with intire leaves

Filamentous, or thready-
leaved Virginia Adam's
Needle—leaves produc-
ing long threads suspend-
ed

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3—†*draconis*

ZANTHOXYLUM

1—*Clava herculis*

2—*trifolium*

ed from the serratures.—

Singularly curious

Dragon-tree-leaved Ame-
rican Yucca

TOOTH-ACH-TREE

[*Clava herculis*] Club of
Hercules, or pinnated-
leaved common Tooth-
ach-tree

Trifoliate-leaved China
Tooth-ach-tree

Omitted in its proper place.

LONICERA

1—*Periclymenum*

—*Peri. germanica*

2—*Caprifolium*

HONEYSUCKLE

With twining stalks

[*Periclymenum*] Common
Honeysuckle—with leaves
placed distinct

—*Wild white English ho-
neysuckle, of the woods
and hedges*

—*Red flowered*

—*Striped-leaved*

—*Oak-leaved*

—*Striped oak-leaved*

—*German, or Dutch red
honeysuckle—the leaves not
perforated*

—*Long-flowering*

—*Late red-flowering*

—*Late white-flowering*

—†*Evergreen American
honeysuckle*

[*Caprifolium*] Italian Ho-
neysuckle, or Caprifoli-
um—with the top leaves
conjoined-perforated

—*White-flowered*

—*Red-flowered*

—*Yellow-flowered*

3—†*sema*

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- 3——†*semper-virens* Evergreen, Scarlet, Trumpet-flowered Honeyfuckle of Virginia—with the top leaves conjoint-perforated, and leafless spikes
——*Dwarf-growing*
- 4——*dioica* Dioecious, or Male and Female Honeyfuckle—with all the leaves conjoint perforated
Dwarf cherry-berried, with peduncles two-flowered
- 5——*nigra* Black-berried Honey-fuckle—with leaves elliptic, most intire, and berries distinct
- 6——*tartarica* Tartarian heart-leaved Honeyfuckle—with hearted obtuse leaves, berries distinct
- 7——*cærulea* Blue-berried Honeyfuckle—with twin berries coadjoined
- 8——*Xylosteum* [*Xylosteum*] Called Fly Honeyfuckle—with leaves intire, downy, berries distinct
- 9——*pyrenaica* Pyrenean Honeyfuckle—leaves oblong, smooth, berries distinct
- 10——*alpigena* Alpine Fly Honeyfuckle—with leaves oval, twin-coadjoined berries
Upright-growing, with peduncles many-flowered
- 11——*Symphoricarpos* [*Symphoricarpos*] Foot-stalk-leaved Honeyfuckle, called shrubby St. Peter's Wort

Wort—with leaves having foot-stalks, and peduncled lateral flower-heads

12—*Diervilla*

[*Diervilla*] Dwarf Yellow Honeyfuckle, or *Diervilla*—with leaves sawed, and lateral clusters of flowers.

Note, Of the foregoing arrangement of the hardy tree and shrub kinds, some are also introduced into the kitchen-garden collection; such as thyme, sage, savory, hyssop, and some other small under-shrubby plants that are often employed in cookery and other domestic uses; also others of a somewhat tender nature, are likewise admitted among the green-house exotics, to have shelter in winter, in case those in the open ground should be killed in severe frosty weather.

